

# COMPUTERWORLD

## Officevision exec commits to Windows

Unix also embraced as ship deadline looms

BY ROSEMARY HAMILTON  
CW STAFF

MILFORD, Conn. — IBM's Officevision will support Microsoft Corp.'s Windows 3.0 and Unix workstations, an IBM executive said last week. While that may boost support for the strategic office platform, the executive said the company has not yet determined whether it can meet an upcoming deadline for two previously delayed components.

Since introducing its strategic office tools and applications integration platform in mid-1989, IBM has maintained that OS/2 is the Officevision workstation platform of choice. The company was widely criticized for such a rigid approach, and some users rejected Officevision because of it.

### IBM will bend

Last week, however, Tony Mondello, IBM's vice-president of office systems development, said that IBM would bend on the issue and support both Windows 3.0 and various Unix-based workstations, including its own AIX-based systems. However, he provided no time frame.

"We are past the point of 'should we?'" Mondello said. "We've now concluded that the [workstation] mix needs to include Windows and Unix."

While that should give Officevision more appeal, Mondello also said IBM may not make the fourth-quarter deadlines for delivering full-function releases of the local-area network and VM versions of the office platform, both of which have already had one delay.

"We will make a determination in December to make sure it's right," Mondello said. "If we

Continued on page 10

## Losses force more Unisys cuts

5,000 jobs to be axed; debt, revenue slump prompt another quarterly loss

BY ELLIS BOOKER  
CW STAFF

BLUE BELL, Pa. — Setting aside funds to cover the cost of slashing another 5,000 positions, Unisys Corp. announced a third-quarter loss last week that exceeded expectations and cast a gloomy outlook on the rest of the year.

A net loss of \$356.8 million for the period ended Sept. 30 included a \$181 million charge to cover a job reduction campaign to be completed by the middle of next year.

In addition, Chief Executive Officer James Unruh, citing ongoing weakness in the U.S. market and a recent slowdown in

Unisys' promising European business, signaled the strong possibility that the company's fourth quarter may also show a loss. For most of the year, the fourth quarter has been held out

as a beacon of light in Unisys' fiscal night.

Users who were contacted last week took the announcements in stride.

"They are trying to do the right things," said Charlie Hamlett, vice-president of information systems at La Quinta Motor Inns, Inc. in San Antonio. "Whether they will be successful, I don't know."

Concern centered on the potential impact of the job cuts on field service and continued uncertainty about Unisys' future. "I'd like

Continued on page 4

### Slow progress

Weak revenue growth has been partially offset by decreased expenses, but Unisys says it still needs to cut 5,000 positions

	Sept. 30 1989	Sept. 30 1990
Revenue	\$2.35 billion	\$2.4 billion
Expenses	\$2.76 billion	\$2.63 billion
Operating loss	\$410.8 million	\$232.4 million

Source: Unisys Corp.

CW Chart: Doreen St. John

## Industry PACs tight with candidates

BY MITCH BETTS  
CW STAFF

WASHINGTON, D.C. — Rep. Robert T. Matsui (D-Calif.) may not exactly be an American household name, but he certainly is a political hero of the computer industry. Industry lobbyists gush over his support for industry-backed research tax credits and fair trade policies.

Matsui's reward has been a steady stream of campaign contributions from the computer industry's political action committees (PACs). According to Federal Election Commission rec-

ords, the six-term congressman from Sacramento received \$9,150 from computer industry PACs for his re-election race, which he is expected to win easily on Nov. 6.

Computerworld's review of

federal campaign records and interviews with industry lobbyists found that the computer industry is carefully focusing its modest amount of PAC money on such longtime friends as Reps.

Continued on page 154

### Inside, outside

Dun & Bradstreet, Motorola and Unisys have the biggest political action committees in the computer industry

Sponsor	Jan. 1989 — Sept. 1990 federal contributions
1 Dun & Bradstreet Corp.	\$110,798
2 Motorola, Inc.	\$97,840
3 Unisys Corp.	\$76,925
4 Texas Instruments, Inc.	\$75,700
5 Electronic Data Systems Corp.	\$69,066

Source: Federal Election Commission

CW Chart: Tom Monahan

## Compaq 386 notebook grip may be shaky

BY MICHAEL FITZGERALD  
CW STAFF

DALLAS — Compaq Computer Corp., which was sitting as pretty as the little pig in the brick house after releasing its Intel

Corp. 80286-based LTE notebook computer last year, may find itself in a straw house circled by wolves in the 80386SX-based notebook arena.

Texas Instruments, Inc. hopes to be one of the wolves: The company plans to announce its Travelmate 3000 386SX-based notebook today. The Travelmate 3000 will be a formidable competitor for Compaq when the two companies begin shipping 386SX-based machines next month and is a sign of things to come in the 386SX-based notebook market, analyst: said.

The TI machine "really compares very favorably and is an indication that Compaq is not going to enjoy the kind of lead in the notebook area that they had a year ago with the first two LTEs," said Peter Teige, a senior analyst at Infocorp, a subsidiary of Gartner Group, Inc., based in Santa Clara, Calif.

Travelmate weighs less than the Compaq 386S/20 — 5.7 pounds compared with 7.5 pounds. The TI machine measures 8½ by 11 in. and is 1.8 in. thick vs. 2.2 in. for the Compaq.

Continued on page 156

## Recession fears put vise on IS funding

BY CLINTON WILDER  
CW STAFF

Depending on whom you ask, the U.S. economy either is heading into a recession or is already there. And information systems budgets from Stamford to San Francisco are feeling the squeeze.

Facing the best-case scenario of a slow year in 1991 and the worst-case scenario of a Persian Gulf war and soaring oil prices, companies across a spectrum of industries are calling on IS to hold spending to this year's level or close to it. Even at companies where spending will increase modestly, words like "careful" and "cautious" spike the conversations of IS executives interviewed about their budget plans.

"We are working enormously hard to hold 1991 spending flat," said Al Hyland, director of worldwide systems management at Polaroid Corp. in Waltham, Mass. "At the same time, requests [for more IS services] from areas like marketing and customer service are up substantially. I haven't yet found a way to resolve those two things."

Doing more with less has been an IS watchword for some time, but corporate demand for

Continued on page 8

## INSIDE

'Open' season: OSF delivers Unix alternative to members. One member, DEC, also pledged to open up its VMS operating system. Stories, page 157.

Sparcstation 2 coming from Sun, which braces for Sparc clones. Page 14.

Tariff 12 stumbles as court tells FCC to revisit AT&T's tariff packages for big businesses. Page 4.

Executive Report: Using information systems to price your company's products. Page 113.

NEWSPAPER

#630\*\*\*\*\* 5-DIGIT 48106  
#U1U7ZE300M039068# 0010189714

UNIVERSITY MICROFILMS INT  
UNIVERSITY MICROFILMS INT  
SERIAL PUBLICATIONS  
300 N ZEEB RD  
ANN ARBOR MI 48106

8672

# IN THIS ISSUE

## NEWS

**4** AT&T suffers a potentially major setback after a federal appeals court ruled the FCC was too hasty in approving Tariff 12.

**4** IBM MVS performance expert J. William Mullen dies at the age of 42.

**6** A Santa Clara, Calif.-based software vendor pulls the plug — literally — on Revlon's inventory management software.

**10** Gupta cleans up its SQLbase Server act with Version 4.1.

**12** New York Telephone files a tariff that could deposit ISDN service practically in the laps of Big Apple Fortune 500 businessmen.

**14** Sun's Sparcstation 2, running at nearly 30 MIPS, will likely steal the show when it's announced next week.

**14** Living a spartan year pays off for Wang, whose revenue has winged back up into the shadows.

**155** On the Left Coast and the Right, two computer technologists are running for governor of their respective states.

**156** Japan is shipping more laptops than desktops as firms such as Fujitsu and NEC keep slimming them down.

## Quotable

**"We have an ethical problem with giving to candidates who might help us down the road — so-called renting votes."**

WILLIAM H. SELLS  
CDLA

*On why CDLA doesn't contribute to individual politicians.  
See story page 154.*

## SYSTEMS & SOFTWARE

**33** The next generation of RISC machines keeps getting racier — up to 80 MIPS worth.

**37** The U.S. State Department resorts to STARS-gazing to retrieve congressional and foreign policy correspondence and background information.

## PCs & WORKSTATIONS

**65** Apple may give second-sourcing a tumble by teaming up with Sony and Toshiba on its next-generation Macintosh laptop.

## NETWORKING

**87** IBM's Netview is the powerful conductor at railroad carrier CSX's large network.

## MANAGER'S JOURNAL

**105** Computer professionals wrestle with questions on the social responsibilities of information systems.

## COMPUTER INDUSTRY

**129** There's no place like home: PC vendors are optimistically predicting increasing sales of home computers.

## EXECUTIVE REPORT

**113** What to charge becomes a simpler question when you have the right information.

## IN DEPTH

**123** Why IS needs more creativity and how to get it. By J. Daniel Cougar.

## DEPARTMENTS

**6, 156** News Shorts

**27** Advanced Technology

**28** Editorial

**112** Calendar

**137** Computer Careers

**150** Training

**145** Marketplace

**153** Stocks

**158** Trends

# EXECUTIVE BRIEFING

**■ Momma said there'd be days like this,** and information systems executives are finding out that truth the hard way. IS managers are struggling in these tough economic times to do more with their systems to stay competitive. In describing their budgets, IS executives are using words such as "cautious" and "careful." In several cases, as General Signal Corp. discovered, the battle is to just keep the IS group together. **Page 1.**

**■ There's a right price for every product and service,** and these days, the margin for error in finding that perfect price point is slimmer than ever. That's why many companies are increasing their use of information systems to research, fine-tune and administer pricing. Equally important, some companies are investing in systems for the explicit purpose of shaving production costs to give themselves more pricing leeway. **Page 113.**

**■ Computer systems are bigger than business.** There are growing concerns about the roles computers and the applications running on them play in society. The message for IS professionals is that they have to make consideration of the system's broad impact part of their daily routine. **Page 105.**

**■ Open systems was the operative word** last week. The OSF received mixed reviews when it said its OSF/1 version of Unix will be shipping to vendors in November. Meanwhile, DEC said it will be developing a way to run Unix applications on processors that run its VMS operating system. **Page 157.**

**■ The long silence of Jim Manzi** on the issue of copy protection came to an end last week when the chairman of Lotus asserted that the notion of intellectual property is at the heart of the software industry. Manzi, whose firm recently won a copyright infringement suit and has others pending, said that rather than stifling innovation, copyrights encourage and reward it. **Page 65.**

**■ The computer industry seems to carefully pick and choose** which congressional candidates it will back with political action committee funds. **Page 1.**

**■ It's getting nasty** in a dispute between cosmetic maker Revlon and software vendor Logisticon. It all started when Revlon said it would withhold payment because

Logisticon's inventory management software wasn't working right. Logisticon responded by pulling the plug on Revlon's software. **Page 6.**

**■ Reorganization is progressing** at Baxter International, where company officials say they are on target for eliminating half of the 3,200 salaried positions by the end of the year. **Page 112.**

**■ Reorganization is also the mandate** at Unisys Corp. The computer maker reported a quarterly loss of \$356.8 million and announced plans to cut 5,000 workers. The loss includes a \$181 million charge for the work-force reduction. **Page 1.**

**■ The first signs of a shift are emerging** as companies look to save money by migrating their T1 networks to public Integration Services Digital Networks. To do that, some firms are taking a hybrid approach, transitioning low-traffic segments to the switched services. **Page 87.**

**■ On-site this week:** Computer terminals in police cars are a crime-fighting tool in Dallas. **Page 76.** IBM's Netview is at the throttle of railroad carrier CSX, where the network management system has control of several mainframes and 20,000 terminals. **Page 87.** Integrating optical storage of images with a relational DBMS is the key to a document tracking application intended to keep diplomats up to date at the U.S. State Department. **Page 37.**

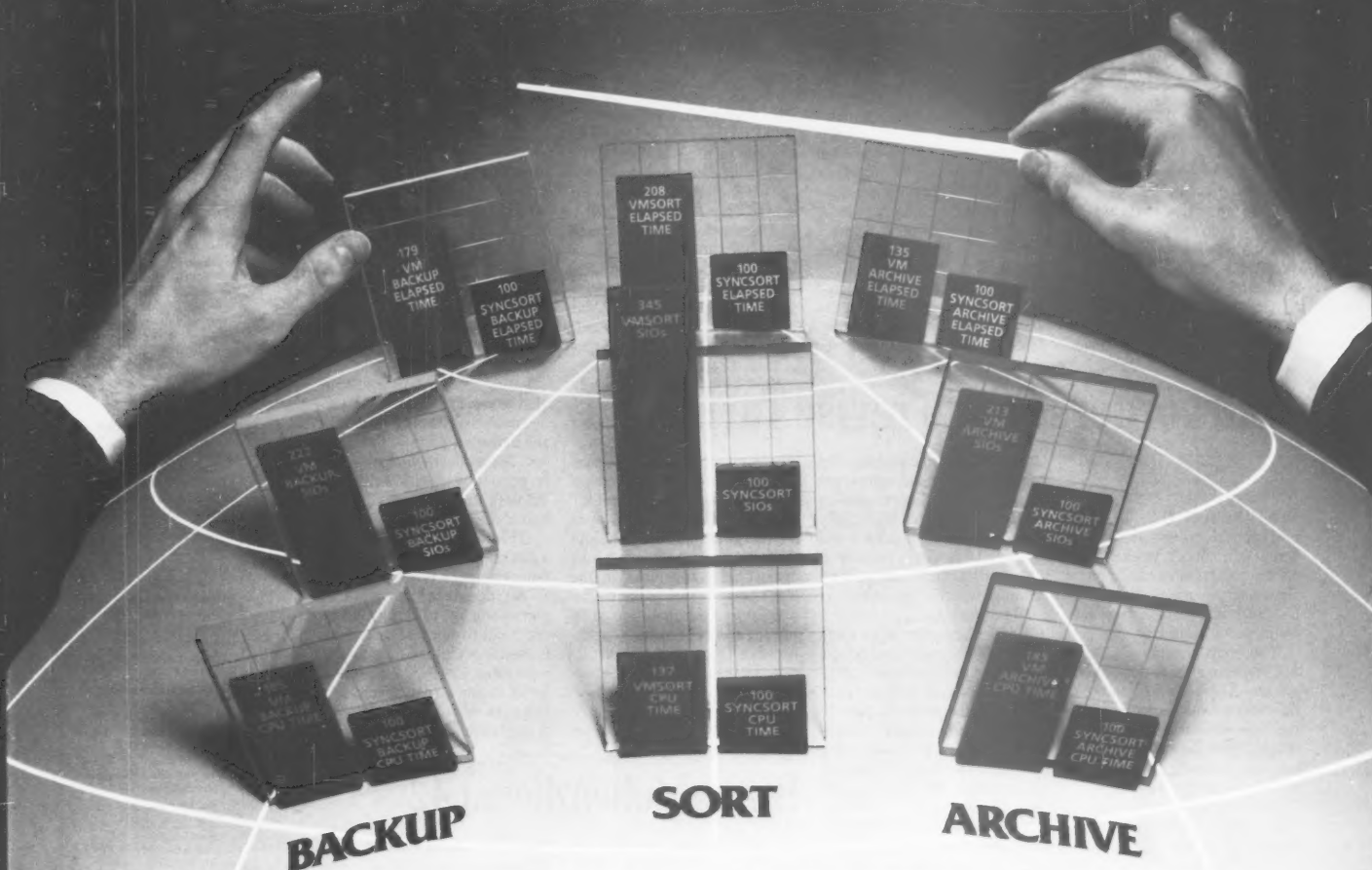
## The Fifth Wave



"IT'S AMAZING HOW MUCH MORE SOME PEOPLE CAN GET OUT OF A PC THAN OTHERS."



# DAY IN AND DAY OUT, SYNCSORT PERFORMS BRILLIANTLY FOR VM AUDIENCES.



VM audiences count on Syncsort for the best performing VM sorting, backup, and archive products. Products that save system resources — CPU time, I/Os, elapsed time, disk space — day in and day out.

**Syncsort/BACKUP (SYBACK)** performs the fastest logical and physical backups, giving you complete file, minidisk, volume and system-level protection. And for disaster recovery, no product can restore a system faster.

**SyncSort CMS** is simply the fastest, most efficient sort, merge and copy product in the VM world.

**Syncsort/ARCHIVE** stores, tracks and retrieves little-used files. User-oriented and exceptionally easy to use, Syncsort/ARCHIVE makes archiving routine, freeing up valuable disk space.

And that's not all. Over the next few months, VM audiences will be introduced to Syncsort's new high performance productivity tools. Unlike other software companies, our commitment to VM is strong — and growing stronger.

If you're looking for today's best performing VM products, look to the company that leaves audiences cheering: Syncsort.

**syncsort**  
INC.

50 Tice Boulevard, Woodcliff Lake, NJ 07675

800-535-3355

## Unisys

FROM PAGE 1

Unruh to tell me when they're going to get well," said Joseph Ambrozio, vice-president of information systems at Philadelphia-based Bell Atlantic, Inc.

Unruh last week seemed unable to do that. Deteriorating economic conditions "are the reality of the marketplace now," he said in an interview. He said he believed customers and the marketplace would conclude Unisys had taken the right course of action.

Revenue for the quarter ended Sept. 30 was \$2.40 billion, compared with \$2.35 billion in the corresponding quarter last year. In the third quarter last year, Unisys reported a net loss of \$648.2 million, which included a charge of \$231 million to cover layoffs and plant closings that year.

However, while the third-quarter loss was not unexpected — the debt-laden \$10 billion

computer and defense company alerted the financial markets to expect it a month ago — analysts and users said they were surprised by the size of the loss, which was three times greater than had been expected. Some also pointed anxiously to the small rise in revenue relative to the year before.

"The most surprising part is Europe was down, which was the source of their potential revenue growth," said John Clomax, a bankruptcy trading analyst at Mabon, Nugent Co. in New York.

"It's a much larger loss than I thought they'd have," said Dean

Sutton, executive vice-president of Softtech, Inc. in Kirkland, Wash., and president of the Cube users group. "It can only mean the U.S. market is nonexistent."

Unisys, which has lost more than 80% of its shareholder value in the past year, plummeted 1½ points Friday to close at 2½ in extremely heavy trading. More than 11 million shares



Sara Leon  
**Unisys' Unruh**  
elected to chairman

## Court orders FCC to revise Tariff 12

BY MITCH BETTS  
CW STAFF

WASHINGTON, D.C. — A federal appeals court last week threw a monkey wrench into AT&T's aggressive campaign to sign up large business customers for customized voice/data networks under Tariff 12.

The court's ruling on Tariff 12 "stalls for at least three to six months AT&T's effort to stem the erosion of its market share in the high-end business customer range," said George R. Dellinger, telecommunications analyst at Washington Analysis Corp.

Responding to complaints by rival MCI Communications Corp. and others, the appeals court said the Federal Communications Commission had applied faulty reasoning in its approval of AT&T's Tariff 12. The court sent the Tariff 12 order back to the FCC for revision, which could take several months.

The court did not declare Tariff 12 illegal, as opponents had requested, and hinted that the FCC probably can find a way to legally justify the tariff. But in the meantime, the ruling may have the practical effect of stifling the Tariff 12 deals still being negotiated or in the FCC's pipeline.

"From a short-term perspective, the problem is that it creates market uncertainty" for unfinished Tariff 12 deals, said Henry D. Levine, an attorney representing many Tariff 12 users. MCI, U.S. Sprint Communications Co. and other less regu-

lated carriers, meanwhile, can continue to offer the same types of custom network contracts.

"In the long term, it's actually very good news for AT&T and AT&T's large users because it affirms that these [negotiated, customer-specific] deals are legal," Levine added.

Tariff 12 provides large users with integrated services and volume discounts in return for five-year contractual commitments — essentially turning a corporation's wide-area network over to AT&T. The carrier has signed up 76 users for Tariff 12, including pioneers Du Pont Co. and General Electric Co. The FCC has approved 60 of the tariff options, and 16 are pending.

"I would expect the FCC to find a way to justify the legality of the tariff, and AT&T could modify the tariff" to comply with new FCC requirements, Dellinger said. "And then it will probably go back to the court," he added.

An AT&T spokesman expressed confidence that the legal technicalities raised in the court opinion "can be easily remedied by the FCC." AT&T said its Tariff 12 service will not be disrupted, and it will continue to offer the service, which it calls Virtual Telecommunications Network Services.

In terms of scoring legal points, however, the ruling was a small victory for MCI, Sprint and others who oppose Tariff 12 as anticompetitive. MCI officials said the decision puts AT&T's Tariff 12 deals in "legal limbo."

In essence, the U.S. Court of

Appeals for the D.C. circuit chided the FCC for taking some legal shortcuts in order to help AT&T compete. "The FCC [one way or another] will undoubtedly permit AT&T to compete effectively against its competitors in the large user market. . . . But we are obliged to insist that it do so by turning square corners of administrative law," wrote U.S. Circuit Judge Laurence H. Silberman for a three-judge panel.

The ruling said the "core issue" is whether AT&T may

## From Blue Bell to Paris

W. Michael Blumenthal, who retired from Unisys as its chief executive officer in April, resigned his position as chairman of the company's board and as a director, effective Nov. 1, Unisys reported last week. James A. Unruh was elected to the additional post of chairman.

Blumenthal, 64, said his business obligations prompted the move. He is a limited partner in the investment banking firm of Lazard Freres & Co. and co-chairman of the newly formed international coordinating group of Lazard, to be headquartered in Paris.

were traded on the New York Stock Exchange.

With the recent third-quarter numbers in, "it's absolutely a given" that Unisys will need to make an asset sale to reach its stated goal of a \$600 million to \$800 million debt reduction by the end of the year, said David Schofield, a technology analyst at Duff & Phelps Investment Research Co. in Chicago.

Unruh declined to specify what Unisys assets might be sold to raise capital. But analysts generally agreed on a short list containing the following: its \$2.5 billion defense business; its data communications subsidiary

Timeplex, Inc., which former Chief Executive Officer W. Michael Blumenthal acquired in 1988 for \$320 million and which grew 20% during last year; and Unisys' finance and leasing arm, Unisys Finance Corp.

Byron Walker, a computer analyst at Moody's Investors Service, Inc., said the finance company — with a book value of \$150 million and debt of \$750 million — was a likely target. "The problem is," he noted, "a lot of companies are selling off finance companies, and it's a buyer's market." Moody's recently downgraded Unisys' debt, as did Standard & Poor's Corp.

charge lower prices for the package deals than it charges for all of the individual parts of the package. In the court's view, the FCC failed to prove "that Tariff 12 is different from the sum of its parts," Levine said.

The Communications Act of 1934 requires the FCC to determine whether it is reasonable for AT&T, designated as a near-monopoly vendor, to charge different prices to different customers for services that are functionally equivalent. The FCC argued that Tariff 12 and its component services are different because they are priced differently.

## BGS's Mullen dies at 42

J. William Mullen, president of the National Computer Measurement Group and senior consultant at BGS Systems, Inc. in Waltham, Mass., died Oct. 23 from complications following heart surgery at St. Luke's Episcopal Hospital in Houston.

Mullen, 42, an expert on IBM MVS computer performance issues, spoke frequently to groups and organizations in North America, Europe and Australia. He served for eight years in the SHARE organization, most recently in the capacity of secretary, and was a member of the SHARE board of directors.

In addition to his duties as president of the Computer Mea-

surement Group, Mullen also served as editor of "CMG Transactions" for eight years and was founding father of the first CMG regional group — the southern CMG — in 1975.

Results from his research on MVS performance have been made available in over 40 articles in both domestic and international journals.

"This is a big loss to all of us," said Roma Dearness, a six-year veteran of BGS who has worked with Mullen over the years. "He was a tremendous wonderful person. I can't imagine him not being here."

Mullen resided in Jackson, Miss. He is survived by his wife, Tommie, and his son, Scott.



Mullen was an  
MVS expert

## COMPUTERWORLD

**Editor in Chief**  
Bill Labin

**Executive Editor**  
Paul Giffin

**News Editor**  
Peter Bartolik

**Assistant News Editor**  
James Connolly

**Senior Editors**  
Clinton Wilder, Management  
Elizabeth Horvitz, Networking  
Patricia Keefe, PCs & Workstations  
Michael Alexander, Advanced Technology  
Rosemary Hamilton, Systems & Software  
Neil Margolis, Industry  
Maryfran Johnson, Systems & Software

**Senior Writers**  
Joanne M. Weizer  
Richard Pastore

**Staff Writer**  
Sally Casack

**New Products Writer**  
Gary Byrne

**Research Coordinator**  
Kevin Burden

**Features Editors**  
Glenn Rifkin  
Joanne Kelleher

**Senior Editors**  
Michael L. Sullivan-Trainor  
Joseph Maglitta  
In Depth Integration Strategies  
Mary Grover Brandel, Product Spotlight  
**Managing Editor, Special Projects**  
Lory Zottola

**Senior Writer**  
Alan J. Ryan

**Associate Editor**  
Cathleen A. Duffy

**Researchers**  
Jodie Nase  
Kim Nash

**Intern**  
Derek Slater

**Chief Copy Editor**  
Donald St. John

**Assistant Chief Copy Editor**  
Joyce Chutchan

**Features Copy Editors**  
Carol Hildebrand  
Catherine Gagnon

**Copy Editors**  
Christopher Lindquist  
Kimberlee A. Smith  
Alice Lesch Kelly  
Kelly E. Dwyer

**Design Director**  
Nancy Kowal

**Graphics Designer**  
Tom Monahan

**Graphics Specialist**  
Paul Mock

**Design Assistant**  
Marie J. Haines

**Assistant to the Editor in Chief**  
Linda Gorgone

**Editorial Assistants**  
Lorraine Witell  
Tammy Gryniwicz  
Stefanie McCann

**Rights and Permissions Manager**  
Sharon Bryant

**Back Issues**  
Margaret McIndoe

**News Bureau**  
Mid-Atlantic  
201/967-1350

Johanna Ambrosio, Senior Correspondent

Washington, D.C.  
Mitch Betts, National Correspondent  
202/347-6718

Gary H. Anthes, Correspondent  
202/347-0134

West Coast  
415/347-0555

Jean Borman, Senior West Coast Editor  
J.A. Savage, Senior Correspondent

James Daly, Senior Correspondent  
Jim Nash, Correspondent

Maura J. Harrington, Correspondent  
Marilyn Scott, Editorial Assistant

Midwest  
708/827-4433

Ellis Booker, Bureau Chief  
Michael Fitzgerald, Correspondent

IBM News Service  
Penny Wann, Director

Main Editorial Office  
Box 9171, 375 Cochituate Road  
Framingham, MA 01701-9171

508/879-0700  
Fax: 508/875-8931

MCIMail: COMPUTERWORLD

Subscriptions: 800/669-1002

# For Security Across Multiple Hardware Platforms, There's Only One Safe Choice.

Trojan Horses. Logic Bombs. Worms. Hackers. Viruses. Disgruntled employees. Information systems today are under siege.

Every enterprise, every environment, every system is vulnerable.

Unless it's protected by CA-UNIPACK®/SCA.



*Only CA-UNIPACK/SCA provides comprehensive, integrated security across all of your most important hardware platforms and operating systems.*

CA-UNIPACK/SCA is a proven, practical solution that includes the most advanced security, control and audit software in the world.

It offers you a secure, protected environment across multiple hardware platforms, operating systems and wherever your distributed processing takes you including MVS, VSE, VM, VMS, networks, DB2 and PC/DOS.

CA-UNIPACK/SCA provides access control, VTAM network control, network session management capabilities and an automated approach to reviewing operating environments. It also offers you enhanced administrative flexibility, unsurpassed ease of use, single point access, and extensive auditing & reporting.

But most importantly, CA-UNIPACK/SCA gives you total control of access to one of your most important corporate assets: information.



*CA's Computing Architecture For The 90s protects and enhances the value of every CA software solution.*

And now, with our Computing Architecture For The 90s, CA-UNIPACK/SCA can deliver even higher levels of integration and provide total data center automation by working seamlessly with other CA-UNIPACKS that automate Production, Storage, Performance Management, and Data Center Administration.

To learn more about CA-UNIPACK/SCA call 1-800-645-3003 and find out where your organization may be vulnerable.

Before someone else does.



© 1990 Computer Associates International, Inc.,  
711 Stewart Avenue, Garden City, NY 11530-4787.  
All trade names referenced are the trademarks or registered trademarks of the respective manufacturer.





## NEWS SHORTS

### Alliant sues over name

Alliant Computer Systems Corp. last week joined the swelling ranks of computer companies hauling competitors to court on trademark infringement and unfair competition charges. This time, the co-defendants are Honeywell, Inc. and a new Honeywell subsidiary composed of its former defense/marine systems business, Test Instruments Division and signal analysis center — and named Alliant Techsystems, Inc.

### HP lowers PC prices again

For the third time in three months, Hewlett-Packard Co. will reduce prices on its Vectra personal computers, the firm is expected to announce today. Since July, prices on the Vectra 286/12 base model have dropped from \$2,399 to \$1,799.

### Ingres ports Windows 4/GL

Ingres Corp. is moving its Windows 4/GL application generator onto four more Unix platforms. According to Ingres, the icon-driven generator will run in the following environments by year's end: HP/UX, IBM's RISC System/6000 AIX, Digital Equipment Corp.'s Ultrix and The Santa Cruz Operation's System V/386.

### U.S. wants relaxed export controls

The U.S. urged its allies last week to relax export controls on a broad range of computers and software for sale to the Soviet Union and Eastern Europe. The U.S. asked the Coordinating Committee on Multilateral Export Controls to decontrol general-purpose software and hard disk drives up to 800M bytes, as well as loosen controls on minicomputers and workstations.

### Esber lands in Poqet

Poqet Computer Corp. has shuffled its executive staff and board of directors. The maker of handheld systems announced that Robb Wilmot, its chairman, has also been named president and chief executive officer. Stav Prodromou, former president and CEO, was named vice-chairman, and former Ashton-Tate Corp. CEO Edward Esber will become acting senior vice-president of sales and marketing.

### Carrier adds reconfiguration

Metropolitan Fiber Systems, Inc. last week announced that customers will be able to reconfigure bandwidth and monitor performance on its metropolitan-area networks. Through Metrofiber Network Reconfiguration and Monitoring Service, users can program Metropolitan Fiber's network control center to switch their circuits to backup lines in case of disaster.

### Low-radiation VDTs debut

Three vendors announced monochrome VDTs that they claim emit only low levels of electromagnetic radiation. Sigma Designs, Inc. offered a monitor for Apple Computer, Inc.'s Macintosh. Applied Digital Data Systems, Inc. introduced terminals for Digital Equipment Corp.'s computers. Qume Corp. offered terminals for DEC and Wyse Technology, Inc. computers.

### Cambex answers EMC

On the heels of rival EMC Corp., Cambex Corp. announced a cache memory system last week for the IBM 3990 Model 3 controller. Cambex will price its add-on cards in the EMC range, which averages about 25% below IBM prices.

### Frame relay blankets Codex line

Codex Corp. said last week it has developed frame relay interfaces across multiple elements of its networking product line. Frame relay is a next-generation access standard for T1 and Integrated Services Digital Network circuits that is more efficient than the X.25 interface.

More news shorts on page 156

## Revlon riles software vendor

BY SALLY CUSACK  
CW STAFF

SAN FRANCISCO — In a case characterized as "shocking" by computer law experts, a Santa Clara, Calif.-based software company abruptly pulled the plug on one of its customers: cosmetics giant Revlon Group, Inc.

Revlon responded by filing a lawsuit in California Superior Court in Santa Clara County last Monday, charging Logisticon, Inc. with extortion and maintaining that the disruption idled hundreds of workers and cost the company \$20 million in product deliveries.

Referring to the action as a form of "repossession," Logisticon President Don Gallagher reportedly instructed his employees to use telephone lines to disable the inventory management software in Revlon ware-

houses after the latter refused to make a major payment.

Revlon contends that it suffered a financial loss when two of its warehouses were later unable to ship products because of disabled software.

On Oct. 9, the New York-based company shot off a letter to Logisticon stating that a \$180,000 contract payment would be withheld due to inadequacies in software performance. Revlon also demanded that Logisticon provide it with access to the source code as a condition for payment.

### Right back at you

Logisticon, in return, shut down the software operation at Revlon on Oct. 15, reportedly disabling warehouses in Phoenix and Edison, N.J., for three days.

"From an ethical viewpoint, I find the behavior shocking," said

Esther Roditti Schachter, a New York lawyer and publisher and editor of the "Computer Law and Tax Report."

Schachter questioned whether the right of repossession claim filed by Logisticon is accurate, given that more than the software was repossessed when Revlon lost money in both product shipments and labor.

Peter Marx, a Boston-based computer lawyer at the Marx Group, said he sees this as more than just a bill dispute. He said this type of action undermines trust between software vendors and the information systems community. "This is a dangerous precedent," Marx said. "My concern is that people will begin thinking of this as more of a means of collecting bills."

Officials at Revlon and Logisticon were unavailable for comment last week.

## Ask buys out Ingres, plans to divide up staff

BY MAURA J. HARRINGTON  
and JEAN S. BOZMAN  
CW STAFF

MOUNTAIN VIEW, Calif. — Despite threats of a proxy fight from one of its major shareholders, Ask Computer Systems, Inc. sealed its acquisition of Alameda, Calif.-based Ingres Corp. last week by buying out Ingres shareholders.

At the same time, Ask announced it would cut 15% of Ingres' staff and a "small percentage" of Ask's staff and divide the entire organization into five separate divisions, according to Peter West, Ask's vice-president of business development, who has helped to spearhead the project so far.

Meanwhile, Ask shareholder James T. Lennane of Naples, Fla., who now owns 7% of Ask, continued to raise objections to the deal and sought election to the Ask board at last Friday's annual shareholders meeting.

Although he had put himself and two associates up for election to the five-person board, Lennane focused on a plea to other shareholders to elect him as a director who would not rubber-stamp management decisions.

Lennane had sought to torpedo the complicated acquisition of Ask, alleging that selling 30% of the company to Hewlett-Packard Co. and Electronic Data Systems Corp. (EDS) in order to fund the acquisition would dilute the value of shareholders.

"I would have taken over Ask Corp. by buying it if the Ingres

acquisition had not been a fait accompli," Lennane said last week. Ask officials said the board will now be expanded with the addition of a seat to be filled by a representative of EDS.

"We won't be able to disclose the results of the shareholders' votes on the proxy fight, but we aren't that concerned. Maybe they'll elect Lennane onto the board of directors, but we don't know," an Ask spokeswoman said prior to the meeting, adding that the acquisition bears no threat to Ingres users.

Ask has appointed Andy Knowles, former top executive vice-president at Digital Equipment Corp. who left to become an independent consultant in 1983, as the general manager of the project to consolidate Ingres' business into one products division.

Ingres' transitional team, an Ask spokeswoman said, will continue to market and develop its products under the Ingres name as well as work with the Ask Products Division in the future to "help go beyond our present markets" while the new Ingres division is being developed.

Eric Wasiolek, product marketing manager of the Ingres/Star and Ingres/Net products, said he felt positive about the acquisition.

"We are absolutely committed to the database business; that's why Ask bought Ingres. They know there's great growth in the RDBMS market still left," Wasiolek said. "Ingres has a horizontal presence in the industry, spanning many vertical markets.

Ask wants to ride that [database] presence to gain access to other market segments. Together, we hope we'll be flying in the face of Oracle [Systems Corp.] with a much superior product," he added.

### Pushing \$140 million

The acquisition was valued at \$106 million for the purchase of Ingres stock, although Ask officials said assumption of debt and other factors pushed the total cost to about \$140 million. In addition to the capital raised from HP and EDS, the company used a \$75 million loan from The Chase Manhattan Bank NA, for which it mortgaged all the assets of the company.

Ask Chief Executive Officer Sandra Kurtzig said Lennane's legal actions had cost the company \$2 million and that he was seeking compensation for the \$2 million he claimed to have spent seeking to force a shareholders vote on the merger. "It appears to me that his intentions were to put this company in play and to see it auctioned off," Kurtzig said. "The board and I believe that this company is worth more than its book value."

Analysts agreed that the Ask acquisition of Ingres would probably help users because of its deep pockets.

"With the backing of EDS and HP, I don't think they will have to cut any research and development... and I think that makes the users feel more confident about the Ingres products," said Paul Bloom, an analyst at investment firm Volpe, Welty & Co. in San Francisco.

"EDS and HP will be instrumental in helping us penetrate into nonmanufacturing markets," which makes up 60% of Ingres' business, the Ask spokeswoman said.

# The Problem With Buying Software From A Hardware Company

*Once a company gets locked into hardware and software from one computer vendor, it operates at the mercy of that vendor.*

Many companies buy and build software that runs on only one kind of computer. Locking themselves into one vendor's hardware. These companies can then find themselves trapped

into buying a ten million dollar computer when a one million dollar computer from another vendor would actually do a better job.

These expensive hardware traps can easily be avoided by using the right software.

Oracle software runs on virtually every computer—mainframes, mini-computers, workstations and PCs. From virtually every vendor.

Oracle software lets companies develop applications that run on all their computers. And share data among them as well.

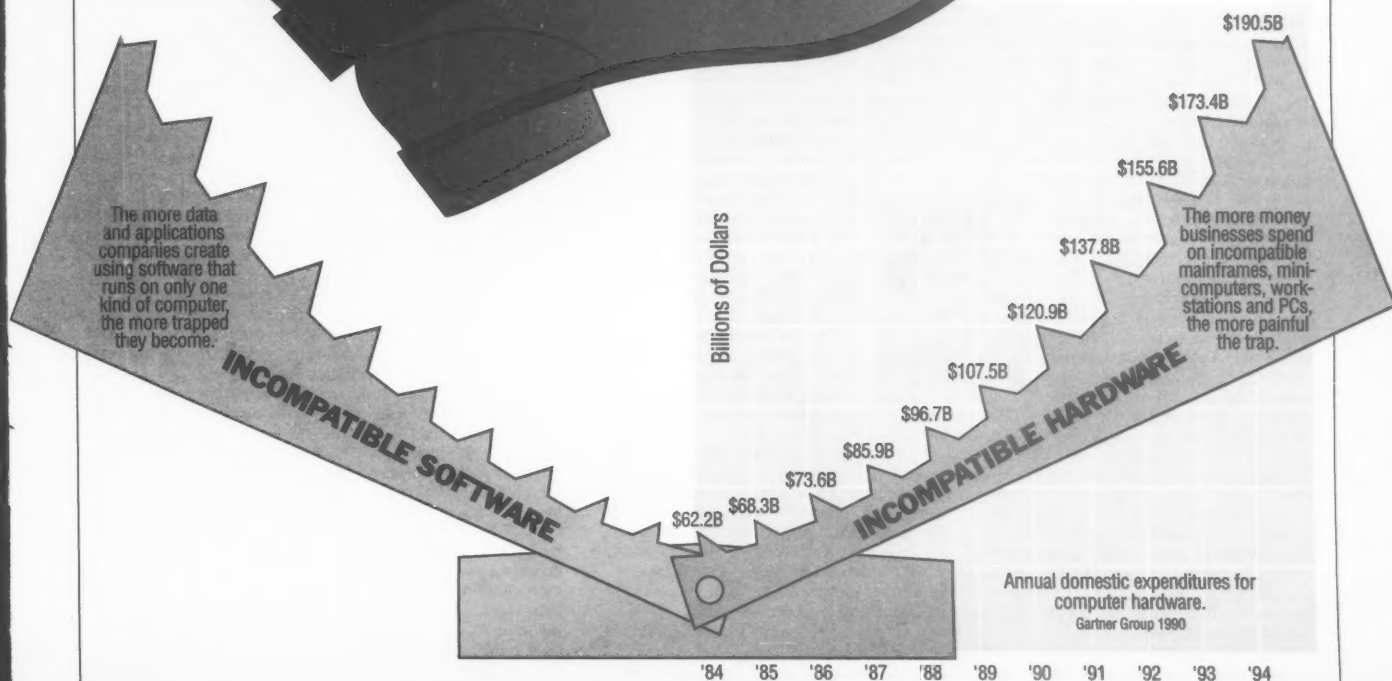
Most important of all, it lets companies exploit newer, faster and cheaper technologies as they emerge.

Call 1-800-633-1071 Ext.8112 for more information.

We'll tell you how you can move forward without worrying about what you're stepping into.

**ORACLE®**

*Software that runs on all your computers.*



# Vendors' pain is users' gain

BY NELL MARGOLIS  
and MAURA J. HARRINGTON  
CW STAFF

The ravaged economy at home and looming fiscal and military uncertainties abroad are turning the computer industry into a bloody battlefield for vendors — and a bloody bonanza for users, according to industry observers.

In the coming months, analysts said last week, we can expect to see U.S.-based computer firms pare down, team up and pay scrupulous — in some cases,

At the semiannual meeting of the Computer Dealers and Lessors Association (CDLA) held earlier this month, David Estes, marketing manager at North Hollywood, Calif.-based Infinite Computer, said he was sounding out people about the recession outlook. "Most of them believe that it's here, and it will go on for at least two years," he said.

While the computer industry may be seasoned by its own earlier downturn, Walker and other analysts agreed, even more lies ahead as companies go head-to-head in a depressed domestic market and a fiercely competitive global arena that many are just beginning to understand.

While recession-battling tactics and strategies will vary widely from firm to firm, analysts noted, one already-emerging trend is likely to remain front and center: intensified focus on pleasing the user.

The shaky late 1980s economy, analysts said, made vendors pay more heed to the old maxim of giving the customers what they want. Now, with shaky ripening into precarious, firms are falling over one another in the rush to convert lip service into real customer service.

Computer Associates International, Inc., for example, spent the late 1980s racking up a reputation as a high-flying growth company with little concern for users, Walker said. After the

shock of a couple of "disastrous" quarters set against the backdrop of impending recession and worldwide unrest, "CA has spent the past year going all out in customer goodwill," she said.

## Oracle speaks

Oracle Systems Corp., another software highflier known for spotty support, is making serious user attention the cornerstone of a massive corporate reorganization (see story page 130).

In fact, conservative ways — once the badge of nonplayer status in the computer industry —

are suddenly in style and likely to remain so. Infinite Computer's Estes found this reaction among fellow computer lessors who foresee a several-year recession: "They're sitting tight," he said. "I can tell you that in this industry, there are very few sudden moves being made."

The new conservatism is not just for leasing firms. To the contrary, third-quarter computer company earnings reports issued during the past several weeks contained a litany of hedged bets and pledges to proceed cautiously.

Ironically, the users now recognized by vendors as key to survival are not as easy to please as was the case even a few years ago. An increasingly sophisticated

and demanding crew even before hard times hit, recession-wary users now sense that they can not afford to make mistakes in selecting technology products and strategies, said John Rohal, an analyst at Alex. Brown & Sons, Inc.

"Companies whose offerings will produce the biggest, earliest returns will sell best to customers who are carefully prioritizing their [technology] investments," he said. This principle, Rohal continued, is keeping spirits and revenues high among, for instance, communications vendors offering products that allow local-area networks to talk to each other and structured wiring systems that tie PC cables into a "smart" central controller.

## Fiscal reality

- Unisys awash in red ink. Page 1.
- Wang breaks into the black but revenue slips. Page 14.
- Compaq price-cutting lifts U.S. market share. Page 129.

novel — attention to their balance sheets. Above all, they will pay court to the customer as they vie for dwindling dollars amid increasingly brutal competition.

It won't be pretty, said one analyst after another. It also won't be new.

"Face the recession?" asked Charlotte Walker, an analyst at Labe, Simpson, Inc. "Hasn't the computer industry been in one?"

## Recession

FROM PAGE 1

better return on IS investments is exacerbated by the economic downturn. In an Index Group, Inc. survey of about 400 high-level IS executives earlier this month, 61% said they are feeling pressure from senior executives or line management to quantify the value of IS.

"While IS is competitive and strategic, it's also a big expense," said Robert Ferkenhoff, vice-president of information services and quality development at Sears, Roebuck and Co.'s merchandise group in Chicago. "We're constantly pruning and re-evaluating."

Evidence of slow times ahead includes the following:

- The Index survey also found that for 1991, respondents projected the lowest IS budget increase since the survey began two years ago. The average increase among respondents will be below last year's projected 6.9% increase for 1990.

- The U.S. government's projection of growth in spending for computer equipment for 1991 is down to 8% from 9.1% in 1990 and is roughly half of the growth rates in 1988 and 1989 (see chart).

- NDMA, Inc., an IS management consultancy in Ridgefield, Conn., reported that the average projected budget increase among its client base is flat, compared with 5% to 10% in 1990.

"We are in a recession, and in many companies, IS is a prime target," said NDMA President Dean Meyer. "The IS departments who aren't suffering are those who have proven they can deliver high returns on investment."

K Mart Corp. in Troy, Mich., for example, recently approved a corporate budget that includes the IS spending amount planned two years ago, said David Carlson, senior vice-president of corporate IS. But even at firms trying to move ahead aggressively with IS, caution is in order.

"My feeling is that we have to spend now, or it won't matter later," said Joe Harris, director of information technology at National Broadcasting Co.'s TV Stations Division in New York. Harris is trying to push ahead with electronic data interchange, personal computers and OS/2 but admitted, "I have to spend very carefully."

In the hard-hit banking sector, times are even tougher. San Francisco-based Bankamerica Corp., which has seen both IS triumphs and expensive debacles during the past few years, is scaling back to a 4% budget increase after recent years in the 8% to 9% range. Some savings will come from closing a Hong Kong data center and consolidating its

operations in London, said Martin Stein, executive vice-president of systems engineering.

Mellon Bank NA in Pittsburgh, planning for what it projects to be the slowest U.S. economic growth in 10 years, will increase IS spending 5%. "But if a war comes, everything's in the tank," said George DiNardo, executive vice-president of infor-

## Winds of change

Spending for computers is projected to fall off this year, although not as sharply as for other equipment

Percent of growth in real spending (1982 dollars)	
Investment in computers & office equipment (mainly computers)	
1988	17.9%
1989	15.4%
1990*	9.1%
1991*	8.0%
All other equipment (including machine tools, automobiles, commercial equipment, etc.)	
1988	9.3%
1989	1.3%
1990*	-2.2%
1991*	-3.5%

\*Projected

Source: Data Resources, Inc.  
CW Chart: Paul Mock

mation management and research. "The impact on us would be very dynamic, and we have to be prepared to cut back."

Mellon will hold the line on programmers, software packages and almost all new hiring, DiNardo said. Plans for an IBM Enterprise System/9000 in the third or fourth quarter depend on how much Mellon can expand its service bureau processing business.

Recession-related cutbacks have already occurred at Stamford, Conn.-based General Signal Corp., which closed a data center and eliminated 17 out of 58 IS jobs (see story this page). "We have a big business in semiconductor equipment, and that's been hit pretty hard," said Glenn Smith, manager of advanced planning.

Midwest Correspondent Michael Fitzgerald and West Coast Correspondent Jim Nash contributed to this story.

## Recession's harvest

STAMFORD, Conn. — Don't tell information systems employees at General Signal Corp.'s IS subsidiary about the "coming" recession. For them, it is here now, and 17 of them, representing 30% of the IS staff, are out of jobs as a result of a data center closing.

In an unrelated change, top IS executive Stefan Gladyszewski left the company two weeks ago to become senior director of development at EMI Music World-wide in New York. The company plans to begin a search for his replacement as director of operations systems in January.

Under a cost-cutting plan devised by Gladyszewski before he left, General Signal Services (GSS) closed its Andover, Mass.-based data center and consolidated its operations at its mid-Atlantic data center in North Wales, Pa. Only three of 17 Andover employees were transferred, and three North Wales employees were let go to make room for them.

One transferee was Andover data center head Robert Barnwell. Barnwell replaced Christian Getman as head of the mid-Atlantic data center. The two others were Hewlett-Packard Co. technology specialists who were needed to support an HP Spectra 955 and an HP 3000 System 70 moved from Andover.

GSS moved two Digital Equipment Corp. VAX 6310 processors from Andover to North Wales to replace a VAX 8810. The consolidation has also cut expenses for peripherals, tape drives and package software licenses. "We've cut back dramatically," said Glenn Smith, manager of advanced planning at GSS.

General Signal had consolidated virtually all processing for its more than 20 autonomous business units in the two data centers last year [CW, Sept. 11, 1989]. "After consolidating most of our company units [into GSS], now we're consolidating ourselves," Smith said. GSS also runs two IBM 3081s.

The Andover center had served as a disaster recovery hot site for North Wales, but now GSS is considering an offer from IBM to provide disaster recovery services, according to Smith.

Gladyszewski left "on good terms" after 11 years heading IS at General Signal, Smith said. At EMI, he is responsible for developing common systems and managing global technology projects among operations in 38 countries, which reportedly have widely varying information management processes. He reports to Anne Payne, EMI's senior vice-president of information technology.

CLINTON WILDER



Stefan Gladyszewski  
left GSS for EMI



# Hard Data vs. Hard Sell

*Oracle's new seminar series generates real-world solutions to the most pressing data management problems.*

The problem with most seminars is the "solutions". Slick sales messages designed more to pitch products than solve problems.

Oracle's new Technology Seminars, on the other hand, avoid the hard sell by addressing the hard issues. Issues identified in hundreds of conversations with customers, industry consultants and Oracle's own technology partners. Topics representing the major technological challenges facing customers in the 90's.

The first in the series is "Strategic Decisions for Information Management", a comprehensive overview of key information management issues and how relational technology can address them.

The four topics covered are: reducing application development backlogs, ensuring that critical applications perform to their maximum potential, sharing data across multiple heterogeneous systems, and keeping end-users in the information system.

This overview is complemented by issue-specific forums that fully define and explore single topics. From CASE technology to delivering the promise of SAA in the VM environment.

Each seminar features a multi-media presentation containing technical demonstrations, examples of solutions currently working in place, plus open discussions where attendees can



question the experts on specific problems. And each session includes a Solutions Kit containing white papers, product information and related research.

As new technology issues arise and user needs change, the subjects of these seminars will change as well.

So customers can come to as many seminars as they want and get answers to specific questions, learn about solutions used in other companies, build an information resource or simply stay abreast of the latest trends.

Space is limited and these seminars fill quickly, so call 1-800-633-1072 Ext. 8118 to make a reservation or get more information about seminar topics, schedules and locations.

Finally, hard data that's easy to get.

## Oracle Technology Seminar Topics:

**Ending Application Backlogs**

**End User Access**

**Client/Server  
Architecture**

**Financial Management**

**CASE Technology**

**SecureSystems**

**Integrating Mainframes**

**Maximizing Critical  
Applications**

**Data Sharing with  
Heterogeneous Systems**

To make arrangements call

**1-800-633-1072 Ext. 8118**

**ORACLE®**

Compatibility • Portability • Connectability

## Officevision

CONTINUED FROM PAGE 1

need more testing, we won't hesitate."

He also avoided making any promises that a delivery date for the Application System/400 version would be announced by year's end.

"We've got some idea now, but I've got work to do yet," he said. "I'm not done reviewing it. We are about where we want to be, but I want to get this one right."

Earlier this year, Mondello said IBM would deliver Release 2.0 of Officevision LAN and VM in the fourth quarter of this year, both of which were delayed from a scheduled early 1990 shipment. At that

time, he also said IBM would announce an availability date for the OS/400 version by year's end.

The deadlines are critical to IBM—not because users are impatiently waiting for the new releases but because of the credibility problem Officevision has had almost since its debut last year.

"I think this would be a setback for IBM," said Brian Cohen, vice-president of technology and research at Dun & Bradstreet Software, an Officevision business partner. "Everybody in the market is waiting to see this vision come true."

McDonnell Douglas Systems Integration Co. is using Release 1.1 of Officevision LAN and is "sort of anxious" for Release 2.0, according to Mark Trentlage, an information systems consultant. "We

have some users right now who are very interested in the integration," Trentlage said. "Release 2.0 is the one that allows that."

Officevision blasted into the market in mid-1989 as IBM's office tools and applications integration platform. Heralded as the first strategic Systems Application Architecture (SAA) application, Officevision is intended to provide a platform on which to use office tools and a variety of applications without moving from one piece of software to another.

However, Officevision met with almost immediate criticism for being little



IBM's Mondello will fine tune 4.0

more than an IBM proprietary collection of routine office tools.

It then took a second major hit earlier this year when IBM delayed the March 1990 shipment of Release 2.0, which some call the "real" Officevision because it has a full office tool set and will provide the complete integration capability for third-party applications.

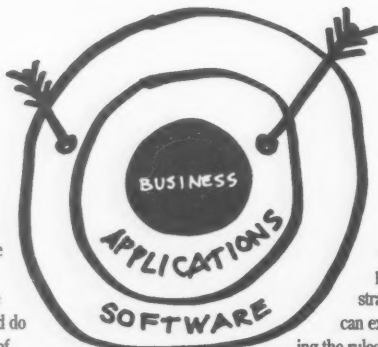
"If they miss another date, then they have a serious cred-

ibility problem," said Stuart Woodring, an analyst at Forrester Research, Inc., which is scheduled to release an Officevision report early next month. "But if Mondello was 100% sure he couldn't do it, he would say so now. He obviously thinks he has a chance."

According to Mondello, test versions of Release 2.0 are out at select customer sites. Furthermore, he maintains he has heard of no critical problems with the software. If there is a delay, it would push off delivery for about another month, he said.

"If 30 days' more testing is needed, and we don't do it, now that's a problem," Mondello said. "Fine-tuning won't be a problem if I needed 30 more days of test."

# As long as the aim of CASE vendors is better software, they'll be off-target.



The aim of CASE should be better business.

"Self-evident," you say? Well, not from what you see and hear in the CASE marketplace.

At BACHMAN, we have some unique ideas about what CASE should do for the enterprise. And unique ways of helping you hit what you're aiming for.

Help business people understand technicians  
Help technicians understand business

Companies realize their full strategic potential when business can talk to MIS and vice versa. For the first time, with the new BACHMAN/Analyst™, an entire enterprise can speak a common language—rich enough for non-technicians to understand, precise enough to create software that works well.

Companies can build reliable systems quickly, and go about the business of doing business competitively.

Create a complete business model—  
Always responsive to change

Staying competitive means first, staying ahead of the changes imposed by the real world of business, and second, having the means to exploit advances in information technology. In both cases, BACHMAN offers a unique advantage.

BACHMAN products decouple business needs from the

technical details of implementation when specifying and designing systems. Companies can respond to changes in business requirements independent of the opportunities or constraints presented by the technology. They can exploit technical innovations without altering the rules that define the business. The result?

Synergy, not conflict.

Generate production-quality systems—  
Systems that remain current

A BACHMAN business model is readily translatable to high performance systems. Surely a boon to new systems development. And the BACHMAN business advantage only begins with new development.

The recognized capabilities of the entire BACHMAN/Re-Engineering Product Set™ mean that business models are kept current, technology designs are easily optimized, and application systems are readily maintained and enhanced. Sound good?

There's a great deal more

We've only begun to zero in here on the competitive advantage BACHMAN represents to your organization. Information about seminars, and substantial proof of what we say, is available.

1-800-BACHMAN

Please call to find out the ways in which our aim is true.

**BACHMAN**  
For more than software. For business.

8 New England Executive Park / Burlington, MA 01803 / Phone: (617) 273-9003 Fax: (617) 229-9904

© 1990 Copyright, Bachman Information Systems, Inc. All Rights Reserved. BACHMAN/Analyst is a trademark and BACHMAN/Re-Engineering Product Set is a registered trademark of Bachman Information Systems, Inc.

## SQLbase 4.1 fixes problems

BY PATRICIA KEEFE  
CW STAFF

MENLO PARK, Calif. — Stung by user complaints and a generally uncomplimentary spate of reviews, Gupta Technologies, Inc. will unwrap SQLbase Server 4.1, a major upgrade of its PC LAN SQL database server for OS/2 and DOS. It is scheduled to ship Nov. 30.

The new version of SQLbase Server will provide cursor context preservation, enhanced router functionality and substantially revised documentation, according to the vendor.

"It's going to be a cleaned up version of [Release] 4.0. User experiences as well as reviews in some major trade journals have pointed out some very substantial bugs, particularly with the programming interface," said Richard Finkelstein, a database consultant at Performance Computing, Inc. in Chicago. Otherwise, he said, SQLbase is "good in terms of what they are trying to do, which is to provide a nice, easy-to-use database server."

Cursor context preservation allows developers to create, with little coding, multiple window browsing and scrolling applications. "Developers can create truly interactive graphical applications for the PC," claimed Bruce Scott, Gupta's senior vice-president of development.

The enhanced router functionality will now allow users of DBwindows, Gupta's single-user engine that runs under Microsoft Corp.'s Windows, to access data managed locally by DBwindows, as well as in remote SQL databases, simultaneously.

The DOS version will cost \$1,995; the OS/2 version is priced at \$2,495. Purchasers of SQLbase Server after Oct. 1 will receive an free upgrade to 4.1. Other registered users under warranty can purchase an upgrade for \$495.



# Give Them The Face They Know And Love

*Applications built using Oracle Tools automatically adapt to multiple user interfaces.*

These days, it seems almost every user, department and workgroup has a favorite Graphical User Interface (GUI). Which means developers building applications for entire organizations must spend months rewriting each application for each incompatible GUI.

Unless the applications are built with Oracle Tools.

An application developed with Oracle Tools automatically adapts to the native look and feel of the computer on which it runs. DECstations, Macs, PCs, Suns or

any other workstation. Even character and block mode terminals. All without changing a single line of code.

So applications can be deployed across an entire organization's different computers. Without users having to be re-trained in an unfamiliar GUI.

Oracle Tools will support both current

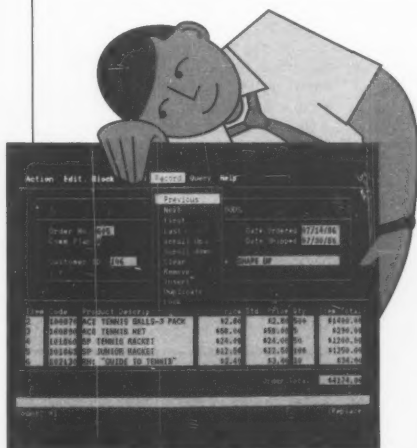
and emerging graphical user interface standards. DECwindows, Macintosh, Microsoft Windows, NeXT Step, Presentation Manager, X/Motif, as well as character and block mode terminals. So it doesn't matter who wins the GUI wars.

Call 1-800-633-1073, Ext. 8114 and receive the free Oracle Tools Information Kit, illustrating the full capabilities of Oracle Tools.

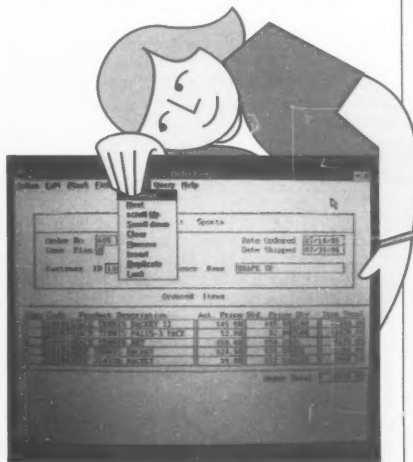
Because everybody likes to see a familiar face.

## ORACLE®

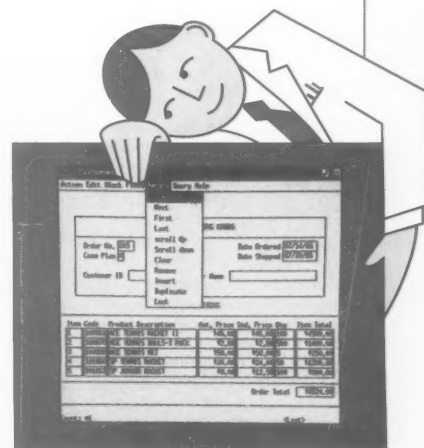
Compatibility • Portability • Connectivity



Character Mode



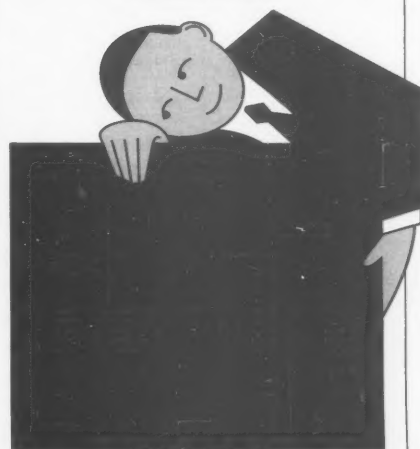
Presentation Manager



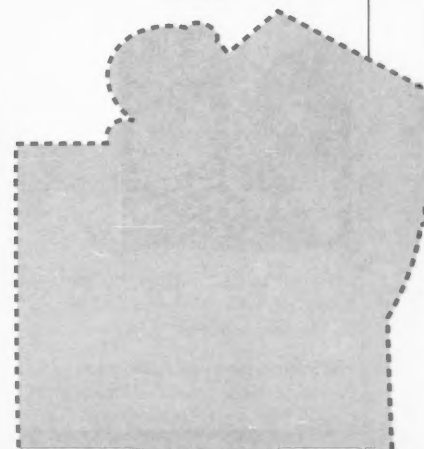
DECwindows



Macintosh



3270 Block Mode



Whatover's NeXT



# Motorola first with microwave LAN link

Use of microwave technology offers an alternative to cable-based office networks

BY JOANIE M. WEXLER  
CW STAFF

NEW YORK — Though currently peppered with "ifs," the 15M bit/sec. wireless LAN technology announced last week by Motorola, Inc. could eventually make traditional cabling seem costly and cumbersome to companies installing and moving personal computers, according to analysts.

Motorola's Radio-Telephone Systems Group said its microwave-based Wireless In-building Network products will hit the market during the first quarter of 1991. Motorola is reportedly the first vendor to announce local-area network technology running over microwave links, which — unlike infrared and laser transmissions — do not require line-of-sight visibility between nodes for communications.

NCR Corp. last month announced its \$1,390 Wavelan wireless LAN interface card, which employs "spread spectrum" technology and also does not require line of sight. The product, however, transmits

## Agree to disagree

Research firms vary greatly on their projections about the likely success of wireless LANs

Estimated shipments of U.S. wireless LAN connections 1992	
Forrester Research	9,000
Yankee Group	300,000
Integrated Strategies	500,000
International Data Corp.	60,000

CW Chart: Paul Mock

at 2M bit/sec., compared with Motorola's promise of 15M bit/sec. speeds.

Motorola demonstrated its technology in an Ethernet environment and said versions for other LANs are in the hopper but declined to be specific. The company said it will position the pending products as an alternative to new — not existing — cable installations to the desktop when

users are extending or reconfiguring wired LANs.

Product implementations will reportedly include a 6- by 4-in. radio attached via cable to the PC. The radio will communicate over microwaves to a central, six-antenna controller, which will route data to the intended receiving station.

Analysts agreed that users could be lured away from using wiring by the technology's network-independent nature (it operates at the physical layer), potential cabling cost savings over time when PCs are moved and speed — provided it works reliably.

The actual benefits are still in question, as products have not yet been created and tested. However, Nick Blazensky, director of the telecommunications division at Travelers Insurance Co. in Hartford, Conn., said he figures that a wireless approach will save him about 20% on network costs. He said he beta-tested an infrared token-ring network from BICC Network Solutions, Inc. in January and has ordered five systems to start.

Bob Rosenbaum, president of Integrated Strategies, an Acton, Mass.-based consultancy, estimated that 25% of the installed PC base moves each year. "Wireless LANs will be a significant factor in the future," he said, adding that he expects the U.S. wireless market to reach \$600 million by 1994.

Todd Dagres, director of communications research and consulting at The Yankee Group in Boston, projects that by 1992, wireless technology will account for 6% of all LAN connections and will be a \$300 million market — up from \$3 million in 1990. Forrester Research, Inc., however, projected a conservative figure of less than 1% of the total LAN market through 1995.

Analyst predictions are all over the map (see chart) because there are mitigating factors, including the fact that the technology is not yet proven, questions surrounding Motorola's ability to market what could be perceived as a LAN product, and psychological resistance to microwaves bouncing around the office.

"To what extent will microwaves in the office be secure?" Dagres said. "I don't think Motorola has yet addressed at what level you can tap into a wireless network once you get access to the frequency."

# Phone company tariff filings expand ISDN service options

BY ELISABETH HORWITT  
CW STAFF

NEW YORK — ISDN has remained one of the few amenities that Big Apple businesses are unable to have delivered right to their offices — that is, until two weeks ago, when New York Telephone Co. finally filed an Integrated Services Digital Network tariff with the New York Public Service Commission (PSC).

Local ISDN options for East Coast users expanded even further last week, with New England Telephone filing its own tariff for the digital service and Teleport Communications Group revealing plans to offer ISDN connections in the greater

New York area, including switched connections to overseas ISDN services, during the first quarter of next year.

The introduction of commercial local ISDN services was good news to New York Fortune 500 companies that are just starting to stick their toes — and business applications — into ISDN waters.

Shearson Lehman Hutton, Inc., for example, "has been waiting for New York Telephone to submit an ISDN tariff so that we can do cost-justification analysis of widespread deployment of ISDN within the firm," said Joseph Tsalik, manager of the ISDN project at Shearson.

While Shearson has no definite time frame for implementing ISDN, the invest-

ment firm has begun "researching which of our current internal applications," such as remote IBM 3270 terminal-to-host and CCITT X.25 connections, "would be more cost-effective over ISDN," Tsalik said. Shearson is one of several large organizations participating in an ongoing ISDN pilot test put on by the New York PSC.

Citicorp, another participant in the pilot, plans to start deploying ISDN services at some of its sites by year's end, according to David Isherwood, a Citicorp vice-president. The financial services giant plans to make use of whatever local, long-distance and overseas carriers "are prepared to offer ISDN services," including New York Telephone and Teleport, Isherwood said.

Like Shearson, Citicorp is looking less at finding new applications that ISDN could make possible and more at how existing applications can take advantage of potential ISDN benefits, Isherwood said. However, Citicorp will only implement "non-mission-critical applications" on ISDN until it feels secure that vendor services are "industrial strength," providing the same level of interoperability, reliability and billing infrastructure that plain old telephone service users take for granted, Isherwood emphasized.

The need to put together a solid support and billing infrastructure was one main reason why Nynex delayed its companies' introduction of ISDN services, according to Nynex spokesman Joe Gustafson. The company also waited for the market to take off, he added.

ISDN Basic Rate Interface line revenues are expected to jump from \$26.5 million this year to \$70.2 million next year and reach \$886 million by 1995, according to a recent report released by Eastern Research Corp. "We're moving out of the trial and into deployment phase with ISDN," said Bob Rosenberg, the Parsippany, N.J.-based research firm's director of analytical services.

Major factors in the expanding ISDN market will be the growth of image transfer and teleconferencing applications and

increasing business traffic flow to Europe.

New York Telephone's initial tariff is for an ISDN Basic Rate Interface service, which defines two 64K bit/sec. B channels and one 16K bit/sec. D channel. It is scheduled to become available next January. Its rate structure levies the following additional charges over the customer's existing class of telephone service:

- No additional charge for digitized voice.
- \$22 per month for circuit-switched data over one B channel.
- \$8 per month to send packet-switched data over the D channel.
- \$75 per month to send packet-switched data over one B channel.

Nynex expects to implement ISDN on 10 New York Telephone wire centers and 12 New England Telephone wire centers by the end of next year, according to Gustafson. However, such centers will re-

## Hook on the line

Enhanced data services such as electronic data interchange and personal computer facsimile are expected to boost ISDN

### ISDN line revenue (in millions)

Year	BRI	PRI
1988	\$4.8	\$1
1989	\$9.7	\$3
1990*	\$26.5	\$6
1991*	\$70.2	\$9
1992*	\$135.2	\$15

\*Projected

Source: Eastern Research Corp. CW Chart: Doreen St. John

main "ISDN islands" until various vendors agree on an ISDN standard for exchanging such routing and caller information.

ISDN users served by different switches will be able to communicate via a regular carrier service, such as AT&T's Accunet, but will not be able to make use of enhanced ISDN-based services such as automatic number identification.

New York Telephone plans to file a tariff for the higher speed ISDN Primary Rate Interface in mid-1991.



## "Software Policy Options for Latin America"

December 9-11, 1990  
Univ. of California, San Diego  
La Jolla, California

Keynote Speaker:  
Dr. José Goldemberg, Brazil's  
Secretary of Science and Technology

(The principal author of Brazil's new software and hardware import rules.)

An executive symposium on the new national policies of Argentina, Brazil, Chile, Mexico, and Venezuela focusing on opportunities for increased trade and industry growth.

For information and reservations, contact: Lee Tablewski, Director of Programs, Institute of the Americas, 10111 North Torrey Pines Road, La Jolla, CA 92037. Phone: (619) 453-5560, fax: (619) 453-2165.

# Why Sybase Is The Standard On The Street.

© Sybase, Inc. 1990. Other company or product names may be service marks or trademarks of their respective companies.

Today, there's a powerful on-line RDBMS that's handling Wall Street's mind-boggling demand for real-time data and historical trading information.

An open RDBMS that integrates both transaction processing and decision support across multi-vendor networked environments, from micros to mainframes.

That RDBMS is SYBASE. And it's the choice of 18 out of the top 22 brokerage houses on the Street.

Our open Client/Server Architecture is the key.

With Sybase's Open Client interface, firms use a variety of familiar front end tools and applications like Lotus 1-2-3 and Microsoft Excel, plus SYBASE applications, independent software vendors' tools, and user-written applications.

At the same time, Sybase's Open Server seamlessly integrates hierarchical, network and relational DBMSs, third-party and legacy applications, and real-time data feeds like stock price quotations, into SYBASE applications.

In the real, multi-vendor world, SYBASE offers a unique return on your investment: an on-line RDBMS that preserves prior investments in both hardware and software.

Savvy firms like Merrill Lynch, Shearson Lehman Brothers, and Fidelity Investments have taken advantage of that opportunity. And so can you.



To find out how, just invest a few hours in a free Sybase seminar.

Call 1-800-8-SYBASE for the seminar nearest you.



## SYBASE

*Client/Server For The On-Line Enterprise*

For more information or seminar reservations, call 1-800-8-SYBASE.

# Wang Labs is back in the black

BY NELL MARGOLIS  
CW STAFF

LOWELL, Mass. — A year's worth of unsparing cost reductions and dramatic corporate reorganization landed Wang Laboratories, Inc. last week right where Chairman and Chief Executive Officer Richard Miller said it would be in its first quarter of fiscal 1991: back in the black.

Analysts hailed Wang's \$2.6 million first-quarter profit — its first positive net income since mid-1988 — as a meaningful marker on the firm's comeback trail. However, most were quick to note that Wang, with first-quarter revenue sliding 6% to

\$576 million from the \$605 million logged in during last year's comparable period, still faces an uphill haul.

"This company has real problems," said Byron Walker, an analyst at Moody's Investors Services. "The good news is that heroic efforts have yielded massive improvements, but Wang is still dependent on its installed base, which is dwindling."

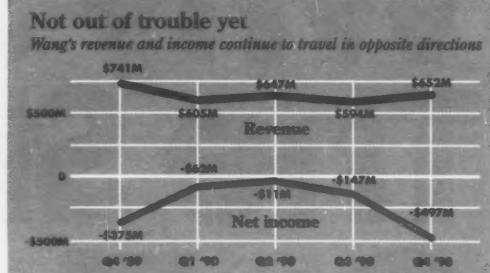
"Wang is going to have to sell a lot more industry-standard technology configured together into applications that people actually want to buy," said Martyn Roetter, an analyst at Cambridge, Mass.-based consultancy Arthur D. Little, Inc. "Their

best bet might be to marry some of their interesting technologies — and they have some — to other companies' [offerings]."

Even assuming that Wang has a winning strategy, analysts questioned whether the firm has the financial staying power to survive as an independent player in a competitive global market.

The first-quarter profit "is very important to us," said Matt Gillman, president of the U.S. Society of Wang Users.

"From the user/IS director standpoint," Gillman said, Wang's posting of a profit "takes an awful lot of pressure off of us. We've been [telling upper management], 'Don't write Wang



Source: Wang Labs

CW Chart: Tom Monahan

off.' The company's earning a profit gives us more credibility and a little more security that Wang is going to be there in the future."

In other quarterly earnings announcements last week, Sun Microsystems, Inc. reported net income up 403% to \$26.1 million on revenue of \$538.5 million — a 26% increase over Sun's sales in last year's comparable period. Amdahl Corp. saw profit increase 41% to \$46.4 million; revenue dropped 9% from last year's third quarter to \$534.3 million. Computer Associates International, Inc., noting balance-sheet as well as bottom-line im-

provements, showed revenue up 10% to \$310.6 million, and profit spiraled upward 191% to \$27.9 million.

Weakness in the financial services sector on which it banked for sales drove Tandem Computers, Inc.'s quarterly revenue below expectations. Tandem posted sales of \$506.1 million, up 10% from last year's third quarter, and profits down 19% to \$31.8 million. Cray Computer Corp. reported a net loss of \$12.7 million on \$159,000 of revenue. In times of economic uncertainty, a research-intensive start-up firm is not the easiest thing to be.

## Sun to double its Sparc performance

BY J. A. SAVAGE  
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. will almost double its Sparcstation performance with its announcement next week of Sparcstation 2, a Unix-based workstation that will run at nearly 30 million instructions per second (MIPS), according to analysts and other industry sources.

The reduced instruction set computing (RISC)-based Sparcstation 2 will either leapfrog or equal the most powerful single-processor workstation currently available: the RISC System/6000 from IBM, which runs at 27.5 MIPS. "It's positioned against the RS/6000 and the Decstation 5000 [from Digital

Equipment Corp.], said Bob Herwick, an analyst at Hambrecht & Quist, Inc. in San Francisco.

"It will be the only 40-MHz workstation out there," said Andrew Allison, editor of "RISC Newsletter" in Los Altos, Calif.

Based on CPUs from LSI Logic Corp. and Ross Technology (through Cypress Semiconductor, Inc.), the workstation will incorporate Sun's own cache and memory controller, according to one analyst.

Additionally, Sun will reportedly announce a graphics coprocessor to speed displays in areas such as mechanical design. Sun's graphics response has been grist for complaints among users and potential users such as Thomas Lasinski, chief of the nu-

merical aerodynamic simulation project at the National Aeronautics and Space Administration in Moffett Field, Calif.

Herwick said the coprocessor will make the graphics response "tolerable, but will frankly lag" other graphics workstations.

Users said that both the Sun announcement and related announcements from Sun-compatible manufacturers (see story at right) will affect their buying habits.

This fall, the Sparcstation 2 is only one of at least three workstations based on Scalable Processor Architecture (Sparc) available at the high end. The others, such as Solbourne Computer, Inc.'s, however, get their speed from multiprocessors.

### We'll be waiting

Steve Dingfelder, manager of technology computer services at General Tire, Inc. in Akron, Ohio, said that he had put off buying some workstations until the Sparcstation 2 became available. "For some applications, the Sparcserver 1+ was adequate, but on other applications, like for finite element analysis, we're holding out for more power and the Sparcstation 2," he said.

Joel Neisen, director of graphics at the Minnesota Supercomputing Center, said that he is eager for more power and that he will not only evaluate Sun's new workstation but also compatibles that claim similar power. So, too, will Nick Majorana, a computer scientist at System Exploration, Inc. in Dayton, Ohio: "If they claim 100% compatibility with Sun, then I'd seriously consider taking one — I'd have to go for the value."

Analysts differ on predictions of cost, with predictions ranging between \$9,000 and \$14,000.

Sun's last Sparcstation, the 1+, was introduced in May. It runs at 15.8 MIPS and 25 MHz and started at \$8,995.

## Sun-sponsored clones will prompt price competition

BY J. A. SAVAGE  
CW STAFF

With both Unix Expo and Comdex/Fall '90 coming up, new computers based on Sun Microsystems, Inc.'s Scalable Processor Architecture (Sparc) are flooding into the market.

This deluge is both expected and dreaded by Sun. The company wants Sparc to be prevalent and thus expand the market for its version of reduced instruction set computing machines. To effect its long-term plan, Sun has licensed its version of the Unix operating system and its chip architecture to all comers. The drawback to that plan, according to Ed Zander, vice-president of corporate marketing, is that with these new products, Sun has to compete for sales.

The Sparc-based system announcements set for Unix Expo and Comdex/Fall include Solbourne Computer, Inc.'s S4000 Desktop, an expandable workstation with its own graphics accelerator, said Allan Snell, vice-president of marketing.

The computer runs at 25.5 million instructions per second (MIPS) or 12 Specmarks (a Specmark is a rating given by Spec, an industry consortium, based on testing a technical application suite). It has up to 104M bytes of main memory, and pricing starts at \$8,995, ac-

cording to Snell.

Also at the high end is Irvine, Calif.-based ICL, Inc. This company gets its speed from symmetrical multiprocessing servers. The DR5 6000 series will be available in two-processor and four-processor versions beginning at \$150,000. Earlier this year, the company said that its multiprocessors would run at up to 60 MIPS, but it could not confirm a MIPS rating on the new products.

Opus Systems Technology Group is offering three product lines: the Personal Mainframe 5120; the Series 500 Personal Mainframe line of personal computer add-in boards; and Opus-engine, a compatible Sparcstation motherboard. The Personal Mainframe begins at \$8,995. According to the company, it runs at 18 MIPS with 8M bytes of main memory.

Tatung Co. announced an expandable, entry-level system for \$6,995. The diskless Tatung Sparc Workstation runs at 12.5 MIPS and includes a floppy disk drive.

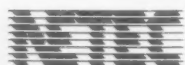
A laptop from RDI, Inc. called Brite Lite is also being announced. The computer runs at 13.5 MIPS and has 8M to 16M bytes of memory. Pricing will start at \$7,000 and go up to \$12,000 for a fully configured machine, according to the company.

## Let CICS Manage Itself

### Automate Your CICS Regions with AOE

- Start, stop and recover CICS regions.
- Time initiate transactions, batch job support and CEMT commands.
- Monitor and correct terminal status.
- Trigger journal jobs on demand.
- Ship early problem warnings to consoles, TS0ids and to the HELP desk.
- Respond to CICS's WTOs, WTORS, abends and log messages with MVS activities, predefined WTOR responses and corrective CEMT commands.

The CICS Automated Operations Extension Facility is a proven approach to system managed CICS resources. Call us today for more information or a trial for AOE.



Netec International, Inc.  
P.O. Box 180549 • Dallas, TX 75218  
Telephone (214) 343-9744  
FAX (214) 343-9009 • TLX 314419



# Waste Management, Inc., is making the world a more beautiful place. And we're proud to pitch in.

Beautiful landscapes. Unspoiled vistas. For years, protecting the environment has been the business of Waste Management, Inc. And they reached the top because one thing was always clear—nobody beat them in customer service.

But when their business grew from \$650 million to \$4.5 billion in less than 10 years, the burning question was: Could they be big and still be the best?

Software AG had the answer.

With our ADABAS and NATURAL application development environment, Waste Management is able to maintain

their high level of customer service with their rapid expansion.

"The power of NATURAL is that it enables us to prepare each of our five hundred field locations for a massive increase in transaction processing," says Ed Bacom, V.P.-Finance, North America Group. "And because it allows us to custom design the system for each operation, we're able to pinpoint the special needs of our customers and fulfill them."

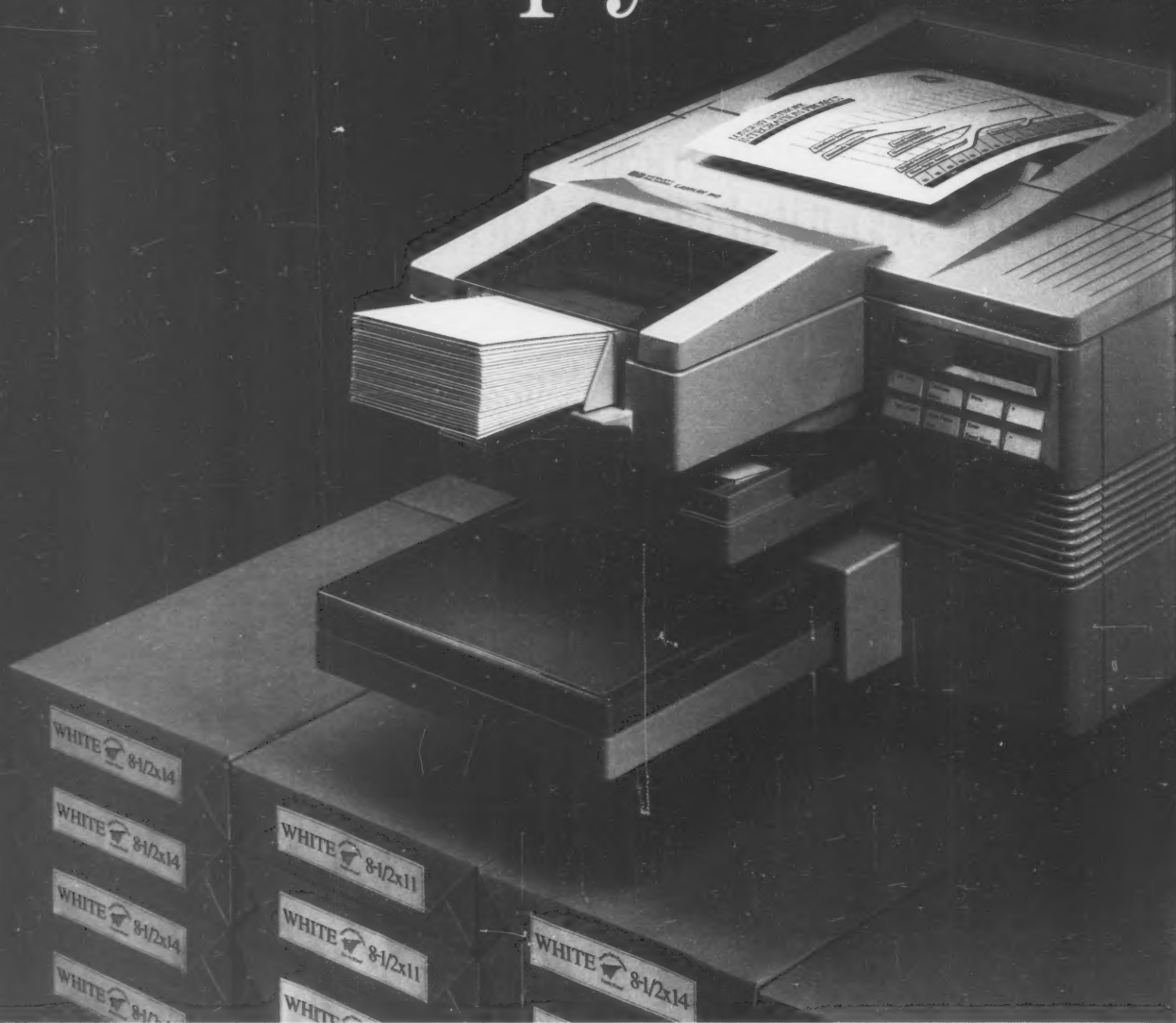
Today Waste Management continues to grow. They are the largest supplier of disposal and recycling services

in the world, and still number one in customer service. That's good news for us. Because only when our customers attain success, can we say the same for ourselves. For more information, call 1-800-843-9534. (In Virginia, call 703-860-5050. In Canada, call 519-622-0889.)

**Your success is how we measure ours.**

 **SOFTWARE AG**

# Keep your users



\*Suggested U.S. list price. Adobe and PostScript are registered trademarks of Adobe Systems, Inc. in the U.S. and other countries. © 1990 Hewlett-Packard Company PE12023

# well fed.

Introducing the new  
HP LaserJet IIID.

Introducing the new HP LaserJet IIID printer. The LaserJet printer for handling the high-volume requirements of the multiuser environment.

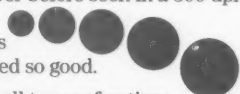
There's a lot for everyone to like and use. Two paper trays that let users easily switch between different types and sizes of paper. With each tray holding 200 sheets. Which means less reloading. Two-sided printing that allows your users to print their thoughts and reports on both sides of a page.

And, if your people would like to say good-bye to feeding envelopes manually, they can—it's done automatically by our optional envelope feeder accessory.



Thanks to the same Resolution Enhancement technology found in the LaserJet III, dot sizes actually vary. So curves really curve. Lines are never jagged. And you get resolution never before seen in a 300 dpi printer.

Output has never looked so good.



Of course, all types of options are available for all types of users. They can customize with Adobe® PostScript® software. Add memory. Or better express themselves with our MasterType library of fonts and typefaces. Even connect a Macintosh.

What *you'll* like is the reliability and service you've come to expect from Hewlett-Packard. And that the LaserJet IIID is available for only \$3,595\*. So call 1-800-752-0900, Ext. 1592 for more information on the new HP LaserJet IIID.



HEWLETT  
PACKARD



# Bull tries soothing users' open systems fears

BY SALLY CUSACK  
CWS/STAFF

ORLANDO, Fla. — Almost 800 faithful Bull HN Information Systems, Inc. users convened here last week to be reassured by their vendor that large systems customers would not be forgotten during the company's somewhat painful transition to smaller Unix-based platforms.

"There is a definite feeling of stability among the users this year regarding Bull's commitment to both proprietary and open systems," said Shirley Eick, president of North American Honeywell Users (NAHU) and interim president of

the Bull User Society (BUS).

Bull depends on its proprietary line of mainframe and midrange processors based on the GCOS operating system to provide approximately 45% of its U.S. revenue, company sources revealed.

"We are very serious about protecting our customers' investments in GCOS," said Maurice Gervais, Bull's director of large- and medium-size systems marketing. He added that the company is sinking millions of dollars into both GCOS and Unix research and development. Gervais said he views Unix capabilities as "complementary" technology for large systems customers as well as a vehicle for of-

fering new platforms and attracting a new user community.

Users expressed confidence in Bull's ability to maintain its large systems environment. Steve Weber, computer services manager at Herff Jones, Inc., an Indianapolis-based manufacturer of high school class rings, caps and graduation gowns, said the company has maintained a good relationship with Bull through the years.

Herff Jones installed a DPS 8000-82 mainframe in August 1989, and, according to Weber, the company is very pleased with the maintenance and service.

Sharon A. Lunder, a data administra-

tion analyst at Graybar Electric Co., which is headquartered in St. Louis, echoed similar sentiments, saying that Bull had always provided good service. Graybar, a Bull customer for more than 15 years, is currently linking its DPS 6 mini-computers — scattered across 19 districts throughout the U.S. — into a Bull 9000 mainframe at headquarters.

This year's BUS meeting marked the first occasion that members of the Honeywell Large System Users Association (HLSUA) and NAHU organizations joined together as a single entity. Eick said she anticipates that moving to incorporate both groups will increase regular membership.

## Show time

Bull had representatives on hand to display the company's new DPS 6000 Extended Capability Processor — a platform designed to couple proprietary DPS 6000 midrange systems with AT&T Unix System V- and Intel Corp. I486-based capabilities.

Nicknamed the XCP/486, the product hooks into midrange 6000 series machines and integrates several applications into a Unix environment, including those from Oracle Systems Corp., Lotus Development Corp. and Informix Corp. The product is available in both 25- and 33-MHz versions with 16M and 32M bytes of memory and is priced at \$17,999 and \$30,199, respectively.

The company also launched the DPS 6000 Model 611, a GCOS-based processor designed to supplement Bull's mid-range line while providing XCP/386 or XCP/486 capabilities. The system offers 16M bytes of memory, expandable to 64M bytes, and can support as many as 64 asynchronous lines.

## CDC watches its fortunes falter in third quarter

MINNEAPOLIS — Control Data Corp. delivered its third-quarter financial results last week, showing a \$1.3 million drop and a substantial decline in revenue from the corresponding period last year, when it sold its Imprimis disk drive subsidiary to Seagate Technology, Inc. and took a pretax restructuring gain of \$8.5 million.

Control Data officials noted that the company's computer products group had exceeded its earnings targets in the quarter but cited unrelated problems in the company's energy management systems group and its automated wagering businesses.

"We are evaluating alternative solutions to these issues, and earnings in the fourth quarter may be adversely affected as a result," Executive Vice-President and Chief Financial Officer William J. Miller said in a statement.

Control Data reported net earnings of \$8.5 million on revenue of \$434.1 million for the third quarter of this year.

In the third quarter of 1989, the company had net earnings of \$9.8 million — which included the net pretax restructuring gain of \$8.5 million from the Imprimis sale — on revenue of \$763 million.

ELLIS BOOKER

**"I was looking for a graphic example of what could be done with a laptop PC... Zenith Data Systems showed me two."**

**ZENITH DATA SYSTEMS INNOVATES AGAIN™**

**SupersPort 286e**

**SupersPort SX**

**ZENITH data systems**

**Groupe Bull**

**The number one laptop brand in America\* offers you the clear choice in portable VGA graphics.**

Zenith Data Systems brings you *two* advanced laptop PCs that can run today's sophisticated color VGA applications, using 16 corresponding shades of gray for superior graphics presentations.

First, there's the number-crunching SupersPort® 286e with its dazzling backlit LCD display. Then there's the SupersPort SX with a Page White screen that virtually duplicates the printed page... plus Intel386SX™ power to handle tomorrow's graphical user interfaces.

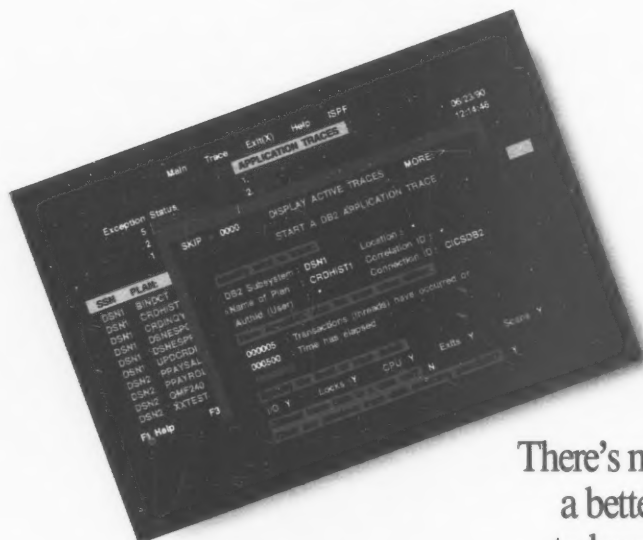
And each features our Intelligent Power Management™ System, which puts power usage in *your* control for hours of battery life.

So, if you want to carry away the clear choice in portable VGA graphics, see our leading VGA-enhanced SupersPort laptops in action. For more information and the name of your nearest Zenith Data Systems Medallion Reseller, call: 1-800-523-9393.

\*Source: 1990 Dataquest estimate for U.S. battery-powered laptops. Graphics simulate Microsoft® Windows™ version 3.11 a product of Microsoft Corporation. Intel386SX is a trademark of Intel Corporation. SupersPort is a registered trademark and Intelligent Power Management is a trademark of Zenith Data Systems Corporation.

© 1990 Zenith Data Systems Corporation

# Be a key player.



With *AccuMAX™*, you can be a key player in maximizing the performance of DB2. Under any circumstance. No matter what your role. No matter what your level of experience.

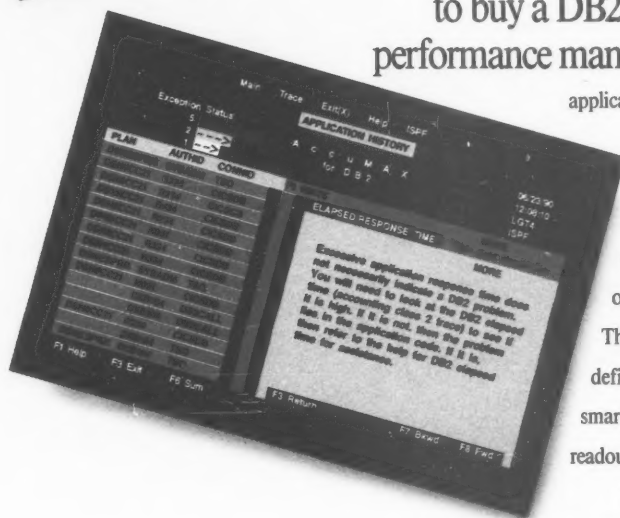
From applications development to data base administration to systems support. All the information and facilities you need to customize the management of DB2. All function key-driven in SAA/CUA format.

There's never been a better time to buy a DB2 performance manager. There's the application trace facility. Using pop-up windows, you can start or stop DB2 traces dynamically. And it's easy to view current and historical data online. So you can diagnose a problem. Tune an existing application. Or test a new or modified one.

If your role is subsystem performance, *AccuMAX* allows online access to any DB2 area. And you can monitor multiple DB2 subsystems concurrently. Without modifying system parameters or rolling through numerous displays.

There's even a multi-level help facility with field definitions, helpful hints and recommendations. And the smart window in the upper left corner gives a constant readout of real-time performance exceptions.

Maximum appeal and ease of use. Under any circumstance. That's *AccuMAX* for DB2. To find out how you can be a key player, call 800 323-2600. Ask for ext. 1184. We'll send you a demo diskette or arrange a free 30-day evaluation.





WHILE YOU WERE OUT

NAME: *[Signature]*

PHONE: *[Signature]*

MESSAGE: *[Signature]*

URGENT



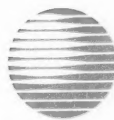


# Half Network, Half Beast

## *Or, How You Can Tame Out-Of-Control Communications.*

In the communications jungle, you'll find a beastly assortment of computers and phones. And networks of every species. An electronic menagerie that has to be tamed to be useful. To do the things you want. No matter what Mother Nature (or Father Time) throws at it. That's where your local phone company and AT&T come in. Using an AT&T 5ESS® Switch and AT&T Fiber, your local phone company can teach your existing networks tricks you never thought possible. Like making them connect and talk to each other. In short, with AT&T, your local telephone company can make your networks heel to your every command.

*Real-World Solutions From  
Your Local Phone Company and AT&T*



**AT&T**

Network Systems

## Silicon Graphics plugging into PCs

BY J. A. SAVAGE  
CW STAFF

MOUNTAIN VIEW, Calif. — Silicon Graphics, Inc. will announce plug-in graphics hardware tomorrow to augment the performance of IBM-style Micro Channel Architecture-based

personal computers. Also scheduled for announcement this week are a server and workstation as well as price reductions on three of its midrange models.

"It's a Micro Channel and AT board that gives substantial workstation performance from a regular PC," said Charles Foun-

dyler, president of Daratech, Inc., a Cambridge, Mass.-based consulting firm.

He added that the boards will run on either MS-DOS and Microsoft Corp.'s Windows 3.0 or SCO Open Desktop from The Santa Cruz Operation.

The products, Irisvision 3D

Graphics Boards, will cost between \$3,500 and \$5,000 and should be available in January.

The company refused to comment on the low-end announcement.

In the midrange, a new model called the 4D/310 GTX is scheduled to be introduced today. The graphics computer runs at 30 million instructions per second and 19.5 Specmarks (a rating de-

rived by running a suite of technical applications from SPEC, an industry consortium). It is priced at \$49,900, according to Paul Koontz, director of graphics marketing. The 4D/310S, a server based on the same configuration, is priced at \$24,900.

The company is lowering its prices on the 4D/380, 4D/340 and 4D/320 between 20% and 28%.

Koontz said the price reduction was in advance of competitive pressures. However, analysts see it as a kicker while Silicon Graphics waits for the next generation of Mips Computer Systems, Inc.'s reduced instruction set computing processors.

## DG users get lower costs, more support

BY SALLY CUSACK  
CW STAFF

SEATTLE — Members of the North American Data General Users Group, gathering last week for the annual meeting here, were greeted with the announcement of lower-cost RISC technology and software support from Information Builders, Inc.

With more than 700 attendees listed at preregistration, Data General Corp. officially demonstrated its MV 30000 computer [CW, Oct. 22] and announced a low-cost graphics workstation for its Avion line of reduced instruction set computing-based systems.

Information Builders announced that its Focus fourth-generation language is now available for applications development and decision support in the Avion environment.

Focus for Unix runs under DG's DG/UX and supports client/server and X Window System distributed processing. Shipping is scheduled for November. Prices begin at \$3,000.

Priced at \$3,995, the AV 100 is positioned as an alternative to X Window terminals or personal computers as a graphics-based interface to Unix applications, the vendor said. DG perceives Sun Microsystems, Inc.'s SLC workstation as the AV 100's closest rival.

The machine, based on a 16-MHz Motorola, Inc. 88100 chip, includes 8M bytes of memory, a 20-in. monochrome monitor, small computer systems interface, Ethernet interface and two serial ports. It can be expanded to support 16M bytes of memory and up to 4G bytes of external hard disk.

The system operates under DG/UX and is said to run at 17 million instructions per second.



© Eastman Kodak Company, 1990

**The paperless office is a myth. The information challenge for the future—necessarily—is to manage the image of that paper swiftly, economically, electronically.**

Is the handling of paper-based information holding up your time-sensitive office operations? Use an electronic image and our application-specific work-in-process software, and Kodak electronic imaging systems can help you streamline and manage the process. Print it. Fax it. Suspend it. Route it. By freeing you from paperwork, Kodak imaging systems can reduce file space and look-up time, and bring you the benefit of a totally integrated information environment.

We have more than 60 years of business imaging experience to share. Ask your KODAK Business Imaging Systems representative how image management can benefit your information management. Call 1 800 445-6325, Ext. 331.

# MANAGE THE IMAGE. CALL KODAK

The new vision of Kodak



# digital update

NEWS AND VIEWS OCTOBER 1990

## Keeping It SIMPLE

By  
**David Stone**  
Vice President  
Software  
Engineering

It was Machiavelli who said, "For every complex problem, there is a simple solution, and it's wrong." And Einstein who cautioned that we should strive to make everything as simple as possible, "but not simpler."

We in the computer industry are often guilty of trying to make things simpler than they are.

So, I'll admit it: things are complicated. For one thing, companies everywhere are working to get "closer to the customer"—which is not as easy as it sounds.

Because most companies have been organized to optimize *internal* communications.

Mathematically-speaking, this makes them somewhat like a sphere—which is the most efficient way to *enclose* a given volume in three dimensions.

A sphere comes into contact with its environment at its surface.

And so, to continue the metaphor, the distance between the center and the surface (the maximum distance any point in the company can be from the outside) gives us a way to represent how quickly an organization can respond to change—or how "close" it is to its customer.

You can see the problem. As a sphere gets larger, the center gets farther away from the real world. In a global economy where things happen faster and faster, it soon takes too long for messages from the "skin" to reach the center and for (re)actions to be carried out. A company loses "touch" with customers, markets, the public.

The simple solution is to split up the volume into many spheres, to create many "centers," and to *distribute* resources—which is exactly what many companies are doing today.

The results are interesting. For example, splitting one sphere into eight spheres with the same total volume halves the distance from the center(s). The organization is twice as "close" to its customer.

Breaking up one sphere into eight also doubles the surface area—or "skin," while making it half as thick. So a company that distributes its resources is not only more responsive, it's potentially more "sensitive," too.

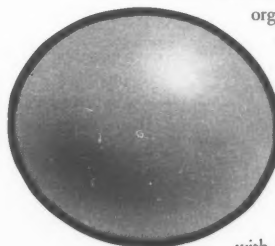
It's a cube rule. To be twice as responsive (half the distance from the customer), requires eight spheres; to be three times as responsive (one-third the distance from the customer), requires 27 spheres. Imagine, the same assets, yet three times more responsive...

### Wait a Minute!

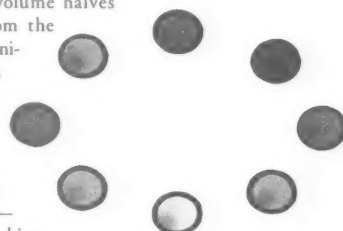
Right. It's not that simple. We're closer to the customer, but internal communications are getting complicated. Eight spheres create 28 formal, bidirectional communication paths. Twenty-seven spheres create 351.

Simply breaking things up, without providing any framework (or *architecture*, as we like to say at Digital) quickly burns up and burns out resources.

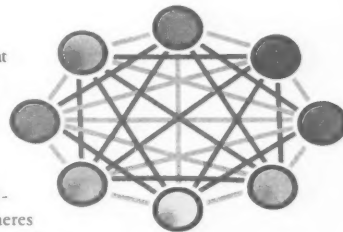
continued >



A sphere is the most efficient way to enclose a given volume in three dimensions.



Splitting one sphere into eight spheres with the same total volume halves the distance from the center(s).



Eight spheres create 28 formal, bidirectional communication paths.



## ► Keeping It Simple continued

### The Simple Answer

Managing the complexity that results from moving closer to the customer is a fundamental problem that companies face today.

What's the simple answer to this problem? Computers. Which is ironic, because the same thing (break it up and distribute it) for similar reasons (to get closer to the user) has been happening with computers.

It happened with hardware. The single big sphere, the mainframe computer, was broken up into many smaller spheres: departmental minicomputers, and then desktop microcomputers.

And it's happening with software. Software functions (such as interfaces to the user, data, and system software) that used to be part of the application are being split off. Increasingly, they are located on different computers, and made available as "services" to applications across the network.

The value of splitting off functions is very high. It makes existing computing resources more flexible, more scalable, more responsive, more useful—and greatly reduces the time and effort required to develop new applications.

Technically, however, it makes things very complicated. Just as with an organization, if you break up a computing system without a plan (or *architecture*) to put it back to work together—the effort of managing new complexity can quickly offset the gains realized by distributing functions.

### Digital's Added Value: Architecture

Digital's first-hand experience with distributed systems has led us to develop a tool for managing complexity and rapid change: *architecture*. Architecture is, in fact, the unique advantage Digital offers.

Our VAX/VMS system architecture has, for example, provided our customers with a consistent and constant applications environment, across a range of systems, for more than a dozen years.

Today, Digital is extending the concept of architecture to create a unified applications environment in which distributed computer

systems, networks, databases, and applications *from multiple vendors* work together—as easily as they do on a single VAX node.

Creating such an architecture is incredibly complex. But Digital has the technology, people, and processes in place to do it.

In fact, we are already doing it. Digital delivers products *today* through our Network Application Support (NAS) services that provide common application, information and resource management, and communication and control services to a variety

to standards become a crucial advantage for our customers. More than any other company, Digital succeeds in all three aspects of standards:

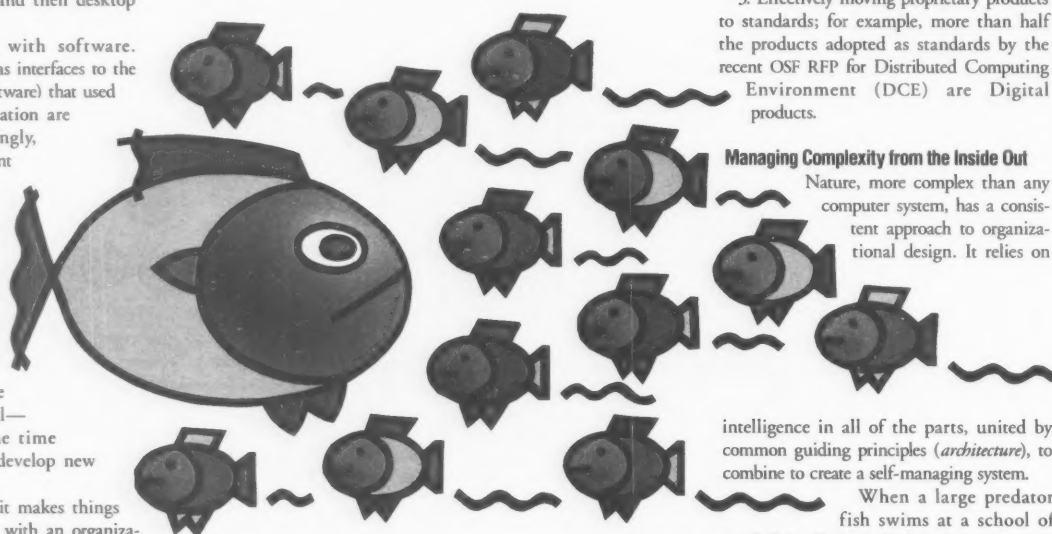
1. Committing to and implementing relevant standards; for example, Digital's re-engineering of the DECnet network to make it OSI-compliant.

2. Providing the richest stream of new functionality on top of standards; for example, Digital's Compound Document Architecture (CDA) and its suite of products.

3. Effectively moving proprietary products to standards; for example, more than half the products adopted as standards by the recent OSF RFP for Distributed Computing Environment (DCE) are Digital products.

### Managing Complexity from the Inside Out

Nature, more complex than any computer system, has a consistent approach to organizational design. It relies on



intelligence in all of the parts, united by common guiding principles (*architecture*), to combine to create a self-managing system.

When a large predator fish swims at a school of small fish, all the little fish, in one instant, wheel around and swim back at the big fish. They neatly divide and re-form behind it.

The little fish do this without any boss fish giving the order. A pressure-sensitive band around each fish allows it to perceive the pressure and angle of the big fish and to respond, in the way appropriate for its position, while maintaining its relationship with all the other fish. The big fish, left blinking, wonders where lunch went.

As systems get more complicated, they can no longer be managed from "outside." Digital's mission is to provide the integrated systems, networks, and services to enable individuals everywhere in an organization to be on the leading edge, to interpret and respond to the pressure waves, and to do the right thing for their organization—naturally.

**Nature, more complex than any computer system, has a consistent approach to organizational design.**

of systems. Today these systems include: VMS, UNIX, MS-DOS, Apple Macintosh, and OS/2 systems, as well as IBM systems, databases, networks, and terminals across a DECnet/OSI network.

### Industry Standards: An Open Architecture

It's complicated enough getting the people in one company to agree. The challenge in building an architecture to integrate applications in a multivendor environment is just that: it's a multivendor environment.

But it is possible. Customers are demanding it. And the computer industry, ever "closer to the customer," is increasingly adopting industry standards, which, taken together, are creating an architecture for multivendor computing.

Here is where Digital's years of experience in developing architectures and sticking



Q and A



## Where's Digital Headed with VMS Workstations?

Many of you may be asking that question these days, especially as you look around and see the increased interest in and availability of RISC/UNIX-based systems—from other vendors and from Digital.

You can be sure that Digital is committed to the VMS workstation platform. We will continue to offer VMS as a choice for workstation operating systems—so your investment in VMS workstations will be protected.

The following reflects ongoing discussions on future directions for VMS workstations.

### Question 1:

*I use VMS. I like VMS. But given the current shift toward RISC/UNIX-based systems, I'm wondering what advantages VMS workstations offer?*

#### Answer:

Implicit advantages include reliability, an assurance of data integrity and security, ease of system management, ease of integration in a multivendor environment, and binary compatibility between new and existing VMS systems. Not to mention Digital's ongoing commitment to industry standards—open buses, NFS, POSIX, and OSF, to name a few.

Also take note of these recent enhancements to the capabilities of VMS workstations (plus some money-saving opportunities):

- The availability of Factory-Installed Software (FIS) for VAXstation 3100 systems, including VMS (with DECwindows), VAXcluster and DECnet-VAX software—at no extra charge on VAXstation 3100 systems with one or more RZ23/RZ24 hard disk drives.
- A Dual Monitor Adapter that allows the connection of two monitors (one must be monochrome) to any model VAXstation 3100, providing a larger screen area for complex applications, or allowing data display on one screen and menus on another.
- Reduced pricing and repackaging of CDROM Subscription Services.
- Special free offer of one decision-support application when you buy a new VAXstation between October 1, 1990 and December 28, 1990, and take delivery before January 31, 1991. Software packages include 20/20 for

VAX, dBASE IV for VAX/VMS, DECdecision, and LOTUS 1-2-3 for VAX/VMS.

### Question 2:

*Where is Digital positioned on price?*

#### Answer:

When it comes to price, we're intent on remaining very competitive—which is why we reduced all VAXstation 3100 Model 30/40 systems by \$2,000; and all VAXstation 3100 Model 38/48 systems by \$3,000. This means you can now get an entry-level VAXstation system for under \$6,000. We've also lowered prices on VMS workstation peripherals, memory, and storage—to support easy, cost-effective upgrading of your VMS workstations.

### Question 3:

*Graphics play an important role in judging workstation capabilities. What are Digital's future goals for VMS workstation graphics?*

#### Answer:

Our graphics strategy is based on industry standards that comply with open system design principles. The next generation of VAX workstation graphics will have two new graphics accelerators which implement the X Window System.

We're focused on two key issues—high performance and cost. We're moving toward offering lower-cost, basic accelerated 2D graphics on every entry-level system. And we're also headed toward lower-cost VMS workstations with 3D graphics capabilities.

### Question 4:

*What are Digital's overall goals for VMS workstations?*

#### Answer:

Digital is a major player in the workstation market today, and we plan to stay that way. To keep our edge in this very competitive arena, significant investments are being put into VMS workstations. Our short-term goal calls for doubling our workstation performance every 18 months. Our long-term goal is to offer the best workstation performance and the best price/performance ratio in the industry.

For more information on VMS workstations, related products, and special offers, contact your local Digital sales representative, or call 800-DIGITAL (800-344-4825).

## NEWS



### More Open Windows.

The new VT1200 is a high-performance, feature-rich Windowing Terminal that gives users access to multiple VT, X, and DECwindows applications through windows on a high-resolution display. It's available with either a 15-inch or 19-inch monochrome monitor. Both monitors offer 100 dots-per-inch resolution and operate at a 72 Hz "flicker-free" refresh rate. The terminal comes standard with 2 MB memory, expandable to 4 MB.

### New PC Debuts.

At NETWORLD 90, Digital announced the new DECstation 425 PC. This high-end system is built on a 25 MHz, Intel 80486 microprocessor, making it ideal for use as a file server or high-performance workstation. It supports MS-DOS and OS/2 operating systems. Configuration features include 8 KB cache memory, three available disk drive expansion bays, support for six AT/XT expansion slots, two dedicated memory option slots, built-in IDE disk controller, and an optional Super VGA video adapter. Entry-level price is set at \$6,055.

# Digital's EDI Solutions: Turning Paperwork into Profit

Accompanied with a bit of a smile, the word going around businesses today is that you've got two chances to avoid EDI. Slim. And none.

And that's probably a good thing. Because EDI (Electronic Data Interchange) enables a business to speed the flow of documents between an organization, its customers, and its suppliers via computer-to-computer exchange.

By using EDI in areas such as order administration, distribution, and purchasing, many businesses are already substantially improving their performance in quality control, time-to-market, customer response, and cost containment.

## Integrated EDI Lifts the Limits

With EDI, an entire business document is converted into a standard format, which allows it to be treated like a transaction that can be read by other computing systems residing with your trading partners—your vendors, suppliers, and customers. The formats used to convert the documents into EDI data are defined by international and industry standards.

Many EDI products are on the market. However, most of these products offer only limited support of standards and Value-Added Networks (VANs)—the regional and international EDI communications services akin to electronic mail systems. This in turn limits EDI products' usefulness to only a few specific industries or business functions.

Quite the opposite is true with Digital's single, yet comprehensive, approach to EDI.

Our approach gives you the ability to consistently integrate EDI with applications across all departments worldwide, including manufacturing, distribution, purchasing, finance, order processing, and administration.

It works like this: An integrated EDI implementation in your company's inventory control system would automatically generate and send a purchase order when a particular item falls below the optimum inventory level. The purchase order would be received by your trading partner's order processing system. That system would then send an order acknowledgment back to you, followed with an invoice upon shipment. This would all happen automatically, without human intervention.

## VAN Independence

Flexibility is a Digital byword. Here, that means the flexibility to implement EDI in a centralized or decentralized fashion, with a few trading partners or with thousands in different

industries worldwide—all with a choice of communication options, including multiple VANs and X.400-based direct communications.

Even if you have an EDI product already in place, Digital can step in and help create a more integrated environment for electronic data interchange.

What we're offering you is "VAN independence," freeing you to do business with customers and suppliers who may all use different VANs.

## The Core Product: DEC/EDI Software

Announced in May 1990, DEC/EDI software is a component of Digital's Network Application Support (NAS)—our blueprint for open, multivendor application integration.

DEC/EDI software consists of three network-based servers:

### ■ DEC/EDI Communications Server

The interface to the external communications environment, serving as the gateway for managing, sending, receiving, and logging EDI information with trading partners—either directly or via VAN services.

### ■ DEC/EDI Translation Server

The source for translation and management functions that convert data from an internal data format to an external EDI standard, such as EDIFACT or ANSI X12, and back to the internal format.

### ■ DEC/EDI Application Server

The tools that allow software developers to integrate existing and new applications with DEC/EDI.

All three DEC/EDI servers automatically log the status and provide a complete audit trail of each document processed.

## 20 Percent Technology 80 Percent Management

EDI is more than a product; it can signal a whole new way of doing business. Getting the right technology in place is really only a part of the solution. The successful implementation of EDI requires considerable planning, designing, and retraining efforts, as well as ongoing management support.

When it comes to EDI, Digital is with you 100 percent. That's why we've recently established business relationships with Price Waterhouse and Coopers & Lybrand. Together, we can bring you the best EDI consulting and systems integration services available, to help you tailor an EDI solution to your particular business.

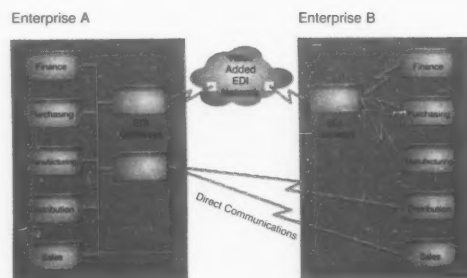
## Putting EDI To the Test

As part of our own EDI pilot program, Digital established an application-to-application EDI connection between an MRP system at our Augusta, Maine manufacturing plant and a chip supplier's production scheduling system in Arizona.

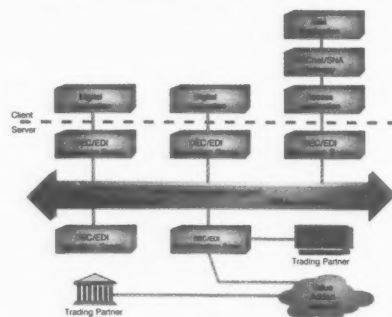
The results speak for themselves: lead time was reduced by 33 percent, purchase cycles were reduced by 86 percent, and inventory was reduced by 95 percent.

## We're Taking Orders Too

Armed with experience gained from pilot programs, like the one in Maine, Digital is now accepting EDI orders from U.S. customers directly into our order processing system. If you're interested in becoming a trading partner with us, contact your local Digital representative, or call the Digital EDI Program Office at 508-493-4971.



With Digital's integrated EDI solution, business applications throughout an organization can use a common, network-based EDI application service.



Digital's distributed approach to EDI makes it easier to work in a business world populated by multiple vendors and VANs.

The following are trademarks of Digital Equipment Corporation: the DIGITAL Logo, CDA, DECdecision, DEC/EDI, DECnet, DECstation, DECwindows, VAX, VAXcluster, VAXstation, VMS, VT. Apple and Macintosh are registered trademarks of Apple Computer, Inc. dBASE is a trademark of Ashton-Tate. IBM is a registered trademark and OS/2 is a trademark of International Business Machines Corporation. Intel is a trademark of Intel Corporation. LOTUS 1-2-3 is a registered trademark of Lotus Development Corporation. MS-DOS is a registered trademark of Microsoft Corporation. NETWORLD 90 is a registered service mark of Novell, Inc. NFS is a trademark of Sun Microsystems, Inc. 20/20 is a trademark of ACCESS Technology, Inc. UNIX is a registered trademark of American Telephone & Telegraph Company.

Listed prices are U.S. and subject to change.



## ADVANCED TECHNOLOGY

### TECH TALK

#### Savings via satellite

■ First Union Corp. recently completed the installation of what the bank holding company said is the nation's first high-speed data communications network linking branch banking operations via satellite. The company said the satellite network is already producing bigger savings than anticipated. Compared with traditional land-based data networks, the satellite network will save the company \$4 million over a five-year period. First Union said the system would yield additional savings of \$1 million per year once a program to link its branches to a central security monitoring facility is in place.

#### Chilly Circuit

■ The space and technology group at TRW, Inc. has produced what may be the most advanced working circuit using high-temperature superconductors. The critical breakthrough came from developing a reproducible superfast switch, called a Josephson junction, for the circuit. The TRW circuit is a four-bit, analog-to-digital converter made from the rare earth compound yttrium barium copper oxide, often referred to as 1-2-3 compound. The circuit uses superconductors that operate between 40 and 77 degrees Kelvin (-420 to -360 degrees Fahrenheit).

#### Pizzabot

■ Researchers at Carnegie Mellon University have developed a voice-controlled pizza-making robot that could give disabled workers and entrepreneurs a chance to get into the restaurant business. The "pizzabot" puts sauce, cheese, mushrooms and other ingredients on a crust and puts the pizza in an oven. The robot, actually an electronic arm, is being put through its paces at a Fox Pizzeria Den in Pittsburgh. If the test pans out, the robot will set up shop in other Fox fast-food outlets in the fall of next year. The robot will probably sell for \$75,000 to \$100,000, researchers said.

## Justice neither delayed nor denied

*Information system saves Florida counties time and more than \$500,000 per year*



Mark Steele

BY MICHAEL ALEXANDER  
CW STAFF

The Gainesville, Fla., judicial circuit judge listened while the state's prosecuting attorney and public defender argued for what each thought would be an appropriate bail. Rather than deciding on whether to set bail and fix an amount, the judge called a short recess and retired to his chambers, where he asked an assistant to retrieve the accused's criminal record from a central database. After mulling over the record, the judge returned to the courtroom and ruled that based on the accused's past criminal activity, he would be kept in jail until trial.

In Florida's 8th Judicial Circuit in north central Florida, neither judges nor justice have to decide blindly when setting bail or meting out sentences. The circuit court system maintains one of only a handful of Criminal Justice Information Systems (CJIS) in the nation. A CJIS is a network of computers used to keep track of those who have been accused of committing a crime as they wend their way through the judicial system.

"CJIS performs the entire scheduling, docketing and calendaring for every felony and misdemeanor in the circuit," said A. Curtis Powers, Alachua County circuit clerk in Gainesville. It was through the 74-year-old Powers' efforts that the system was installed in Alachua County and tied to judicial agencies in the 8th Circuit's six counties in northern Florida. The system also generates arrest, bail, sentencing and case management reports in far less time and at far less cost than was thought possible, Powers said.

The CJIS, which has been in operation for about 10 months, will save the

circuit counties more than \$500,000 per year, according to Powers.

County and circuit courts are swamped with paperwork that judges, clerks of courts, sheriffs and several others within state judicial systems are required by state law to process for all sorts of crimes. Inevitably, data must be shared among all of those who handle the cases that move through the justice system, adding to the mounting paperwork. As crime increases, jail populations swell and caseloads multiply, a state's demand for crime data is overwhelming counties and circuits.

#### Roots of CJIS

The CJIS began as part of a semiautomated, statewide "offender-based tracking system" that was mandated under a state law enacted in January 1988. Five of the six counties in the 8th Circuit installed the tracking systems; the sixth — Alachua County — took a different tack. Alachua opted to install a system that not only fulfilled the requirements of the law but would also go beyond it to interconnect with the surrounding counties and serve as the hub of what would become the CJIS. More importantly, it would be fully automated.

The system at Alachua recorded dockets, arrests and sentences but was not fully automated and was unable to track cases by charge or count, Powers explained. The county's mainframe was also unable to produce offender-based tracking system reports, otherwise known as "blue sheets," from among several other documents required by the 1988 law.

"The blue sheets were our toughest report," Powers said. "We were required to file one for each of the county's 25,000 criminal cases a year. Each took a half hour to complete. They

were impossible to keep up, and [the county was] thinking of adding six more employees at an annual cost of \$150,000."

Now the paperwork can be completed in minutes using a CJIS consisting of computers from IBM, Digital Equipment Corp., Siemens Nixdorf, Inc. and others. In Alachua, which handles 85% of cases in the circuit, the system includes a Nixdorf Siemens triplex processor Targon 3550 supermini-computer running Unix V, 8174 control units that link Alachua's IBM mainframe to the rest of the circuit, an X.25 packet-switching network for county-to-county communications and a fourth-generation relational database to generate the mandated reports.

The circuit's administration of justice begins when sheriffs enter arrest and booking information into the system. CJIS generates a case number based on the severity of the charge and provides case information to the chief judge, state attorney, public defender and circuit clerk. With data in hand, the clerks schedule court appearances and docket dispositions and sentences as well as motions filed by attorneys.

Circuit judges have access to criminal histories as they set bail and pronounce sentences. Also, the chief judge knows the precise number of cases on his docket and the availability of every judge. Circuit judges know their case schedules and have access to information on docket lines in other counties.

The system is easy to use, Powers said. A series of menu guides users through each program. A specially designed phonetic name search enables users to retrieve criminal histories quickly. Data field codes facilitate the preparation of state-required forms and ad hoc reports.

## EDITORIAL

## Just tariff-ic

ONCE AGAIN, FEDERAL regulators, or more accurately, deregulators, have found themselves at odds with the courts on the thorny issue of competition in the massive long-distance telecommunications market.

This time, the courts have raised questions about the legality of AT&T's negotiating special rates with big customers under the auspices of the Tariff 12 option, which the Federal Communications Commission has previously allowed (see story page 4).

While the courts won't likely repeal the six-dozen Tariff 12 contracts that AT&T has already inked, at least not soon, the dispute will probably take AT&T out of the big contract competition until it is resolved. So for starters, you big customers have one less competitor to court you, leaving only two other significant suppliers.

The courts' logic is, well, logical. It is their job to ensure that competition is fair and that customers aren't discriminated against or made to subsidize customers who get preferred rates.

The courts want the FCC to prove that the telecommunications services offered in customized mode to Tariff 12 users are fundamentally different from those offered to non-Tariff 12 users. In fact, they are not — to any great degree. So yes, these service offerings are discriminatory in this sense. Thus, AT&T, which already holds a huge majority of the large-site contracts, faces an uphill struggle against the courts.

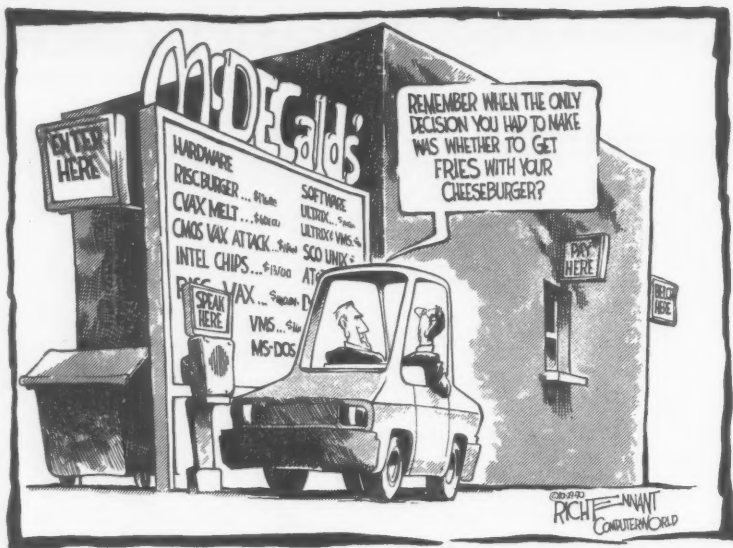
In the meantime, MCI and Sprint, AT&T's main competitors, are free to offer strikingly similar deals without regulation. The *de facto* justifications are that AT&T is the dominant carrier (it is, undeniably) and that the market needs more competition, not less. No argument there.

But if that is the case and if that is the ultimate goal of the courts, the government or whatever body has jurisdiction over these matters, then why doesn't someone step forth and tell us just *what* level of competition or market share will be deemed acceptable? Would a 75% big-business market share for AT&T do it? How about 50%?

What the regulators and courts are doing now is casting confusion and doubt into the marketplace. Heretofore, AT&T was apparently free to negotiate more than 70 Tariff 12 contracts with big companies such as General Electric. MCI has mega-users such as Merrill-Lynch on its special-rate trophy wall, while Sprint has Sears. Can customers continue to build long-term plans around the feasibility of negotiating such contracts in the future? Can the current special-rate customers expect their contracts to be invalidated soon?

No one ever said the breakup of AT&T and the insertion of competition into the domestic telecommunications market would be easy. Similarly, few anticipated the magnitude of the benefits that have been gained as a result.

The judges and the FCC live in the same town, are paid by the same purser and are responsible to the same constituency. Is it asking too much that they deliver consistency and clarity in promulgating rulings of such broad impact?



## LETTERS TO THE EDITOR

## Think twice

Charles Lecht's "Artificial ignorance: Not bliss" [CW, Oct. 1], argues that the computer can add to human ignorance. In many respects, this gives the professionals in our industry a responsibility that is often forgotten.

We need to always understand what technology can and cannot do. Too often, our capacity to think creatively about our world is undermined by the very information that is supposed to help us understand it. Too often, technology replaces thought; "data mountains" obscure basic questions of purpose. We need to be aware of the risks of confusing what computers can do well (process and store information) with what they cannot do at all (reason and feel). Technology will always be a tool to enhance the human mind, not replace it.

Eric D. Goldfarb  
Manager of  
Information Systems  
Lintas: Ceko Communications  
Warren, Mich.

## Unthinkable

Regarding the Viewpoint article "Artificial ignorance: Not bliss" [CW, Oct. 1], Charles Lecht has mixed together several issues. First, public health, welfare and social policies are never in harmony or complementary to science and technology or defense policies. All this has absolutely nothing to do either with artificial intelligence or artificial ignorance.

Computers are neither thinking nor mental effort-saving devices. I have never seen computer-aided philosophy, logic, pure mathematics or theoretical physics, the way Lecht implies.

In genetics, the deciphering of the genetic code would be unthinkable without very powerful computers.

It is one thing to create a theory, as Einstein did, but quite another to try and confirm its consequences, such as the existence of the black holes. The more one tries to achieve, the greater the risks one encounters and has to take. As Theodore Roszak put it: "To claim that a computer will ever master our messy human realities — or indeed improve the mind's way of dealing with them — is . . . a sign of the madness of our time."

Igor Fodor  
Munich, Germany

## Think again

In your editorial, "Distant Thunder" [CW, Oct. 15], it seems that all of its paragraphs are in support of the idea that "the demand for skilled professionals will outstrip the supply by a substantial margin." I am questioning how the following paragraph supports the writer's prediction:

"Fully 80% of the meager labor-force growth in the U.S. will be composed of immigrants, minorities and women. Only 45% of the labor force in the year 2000 will be white males, whose numbers have dominated IS employment."

I do not want to put words in anyone's mouth, but to me the above suggests that the 80% of the labor force that will be composed of immigrants, minorities and women will not alleviate the shortage because they are not considered skilled professionals.

If this is not what was meant, why is the above breakdown significant? How is this helpful in substantiating the editorial's

prediction? As long as they are skilled professionals, why should we worry about the fact that they are not the same white males who "dominate IS employment?"

Susan Farkas  
Citibank  
New York

## Think deep

Your readership, I am sure, found the recent article about Deep Thought, the chess-playing computer, very informative [CW, Oct. 1]. Unfortunately, the article concludes by stating that the Deep Thought team is working on the next-generation machine at Carnegie Mellon University. That is inaccurate. Hsu, Anantharaman and Campbell brought Deep Thought with them when they joined the IBM Research Division after having received doctorates in computer science at Carnegie Mellon in 1989. Their current work on Deep Thought and its successors is an IBM research effort. The ultimate goal of the project is a massively parallel special-purpose computer system that is 1,000 times faster than the existing version.

Kenneth J. Rowe  
Manager, Information  
IBM Research Division  
Yorktown Heights, N.Y.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: COMPUTERWORLD. Please include a phone number for verification.

# Shaping up IS support staffs

BARRY WILMETH



A few summers ago, I have to admit, I was a little bit overweight. Something had to be done, and like everyone else, I wanted instant results. I needed to be trim again. I needed it to happen tomorrow, or at the very latest next week.

Well, it doesn't work that way. To trim a few extra pounds and correct some poor eating habits requires careful planning, commitment to the plan and a positive belief that it's going to work.

The same principles and behaviors apply to managing information systems projects and IS departmental support services. There is always a need to cut back a little more, readjust the plans, change the bad habits and rededicate both the IS people's and end users' commitment to the plans.

Trends such as outsourcing, though not really new, are creating serious concerns for IS.

The simple truth is that the profession of IS support is going through a painful and dramatic cultural transformation. Since it

Wilmeth is facilities manager for the Pacific Air Command Center at Hickam Air Force Base in Honolulu.

is the application of knowledge, not the processing of information, that gives a business its competitive advantage, a corporation strives to get and maintain a business advantage in its primary line of work.

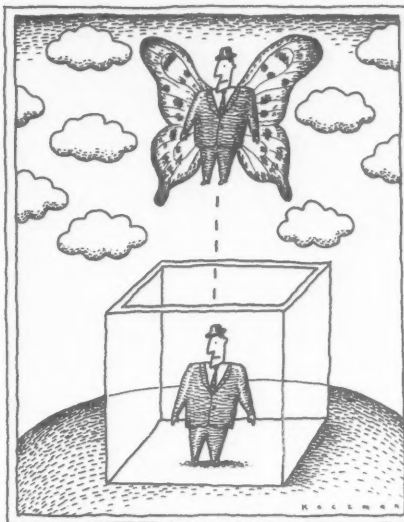
Whatever that line of work is, it requires information processing, which is a support activity. Dedicated outside support is the corporate transformation that has already begun. It is the role of IS professionals that is changing at an extraordinary pace.

The traditional role of the IS staff member is changing into that of a team-oriented specialist.

A "counterculture in values" among business leaders may be directly attributed to the newer views of human resource management, emphasis on assertiveness skills and the decentralization of the formal channels of power. Because those skills and values are directly aimed at the end user of information systems, the IS support staff is now seen as support only and not as a contrib-

uting member to the organization's business success.

Business management Machiavellians have never seriously wanted technologists to have input at annual meetings or mar-



James Kacmar

keting reviews or to make any forays into sales or manufacturing anyway.

That's because IS managers and professionals are, by their very nature, oriented toward

technical issues. Because their support role is minor compared to the total responsive behavior of the organization, their job turnover rate is higher than any other group, and their contributions and proposals are often overlooked or unappreciated.

From Peter Drucker to Isaac Asimov, there is agreement that the 21st-century organization will comprise small sets of teams networked together to accomplish specific business tasks. Organizations are destined to become confederations — assemblages of specialty teams with team leaders and very little corporate bureaucracy. How ironic it is that IS support services and professionals are leading the way to the unorganizing of corporate America.

They have become the leaders in this area in two ways. First, with the ability and knowledge of providing direct business information processing needs, IS support organizations have become quickly and firmly established. Second, they have swiftly adapted to the specificity and objectivity required in their contractual roles. Thus, almost overnight, IS sup-

port organizations have become solid and successful firms in their own right, with professional staffs.

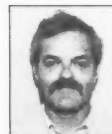
The role of IS support organizations is clear. They now have charge of their own organizations, and they are in demand because of their important contributions to the competitive nature of American business. Finally, because IS support is really a means of business operations and not an end, "contracted IS support" provides greater flexibility in the management of support activities on both sides, benefiting both the business requiring support and the private IS support company. So outsourcing is not a bad thing for IS.

I was lucky — I trimmed down and got through my weight-loss fight. It was a long, trying period that took a lot of perseverance and attention to a new daily regimen of both diet and exercise. The transformation I went through was great. I've readjusted well. I just wonder how long it will be before I fall back to my old ways and weight.

In the same sense, the transformation of IS professionals is cultural and necessary and should be profitable. The direct pioneering of unorganizing corporate America also requires dedication and perseverance. IS as a clear support function, as part of a team-oriented approach, will help lead 21st-century business strategies to success.

## Secret to skyrocketing success: Kill standards

JEFF ANGUS



What would you think if I told you that most information systems organizations spend 3% to 5% of their time on an activity that not only doesn't contribute to the bottom line but actually degrades the performance of end users? Okay, I'll tell you. It is true, and I'm referring to time spent establishing and enforcing standards.

Standard-setting is the embracing of a group mean. It ignores the individual needs of the people working to make money or achieve success for the organization in favor of the convenience of the IS staff. Fortunately, not all IS organizations fall into the standards trap.

Angus is a manager at Farallon Computing, Inc., a manufacturer of Apple Computer, Inc. Macintosh networking hardware and software in Berkeley, Calif.

"Our job is focused on solving problems, not on making it easy for our staff," Rick Nordtvedt, an information center manager at Federal Express, said to me recently. The Federal Express approach to standards is regional, allowing each distributed operation a task force to assess for itself what tools best help that operation meet its goals.

Nordtvedt explains that the central information center operation provides advice and helps negotiate with vendors. But because the end users are selecting their own software and hardware, they get something that fits their business needs. And because they're taking ownership of the decision, they're taking responsibility for making the decision work.

The Federal Express approach guarantees the IS staff a challenging job but also guarantees that each user has a stake in the success of the tools that are selected. Standards guarantee simplicity for IS staffs at the expense of what I call "The Mean

Effect" for the end users.

The Mean Effect is this: By establishing an average as a standard, the implementor is disenfranchising any subject who is not near the standard mean in perception or ability. Noncustomized education works the same way in our schools. Classes proceed at the pace dictated by standard assumptions for children that age. Brighter students are hindered. Slower learners are ignored. About 40% of the kids are "punished" by classes that ignore their needs. This is an example where there is a bell curve — that is, a clumping of most cases near the mean.

In most organizations, there is no bell curve, only an even distribution across the board. The mean is likely to appeal to and work only for the mediocre.

In a distribution like that, playing to any one taste is tantamount to guaranteeing mediocrity. If you want to provide quality services, you have to customize products to each customer's definition of what quality is. Federal Express finds this easier to do because it has a culture set up "to empower people and give them the tools they need to make the business work," according to Nordtvedt.

This is a user-centric view of

business tools — optimizing the work of the employees by giving them appropriate, custom tools — as opposed to a techno-centric view, where workers are wrapped around whatever technology is deemed best by the technology professionals. Federal Express has been approaching its business this way for a long time, Nordtvedt says. There are some key advantages to this method and some disadvantages as well, he adds.

For one thing, while end users don't always get the best tools, the tools they do receive get used more. Nordtvedt estimates that Federal Express gets a far better return on its investment in user-selected technologies because work accomplished is more a function of end-user variables than the differences between possible technologies.

In other words, an employee with an investment in a way of accomplishing work can get more done than an uncommitted employee with more advanced technology.


The cons of the system are obvious. Technology professionals have to be quick on their feet to support the multitude of products that pervade a user community set up this way.

Local support is critical for the success of the destandardized operation. Each site maintains its own support mechanisms — formal and informal. Federal Express seems to understand that it takes fewer people to support end users when the support is dispersed rather than centralized.

Admittedly, Federal Express has some special advantages in implementing user-centric technology. For one thing, its culture pushes the idea of getting as close as possible to its customers. Nordtvedt notes that this strategy is an internal analog, a message to IS that this is the way to work with end users. Also, the business that Federal Express is in forces it to learn to adapt. The accelerated change patterns of the delivery business mean Federal Express employees are constantly thinking about ways to make change work for them.

Standards can benefit organizations that worship mediocrity but guarantee mediocrity for those that want better. Not all organizations can be as innovative as Federal Express, but if you are standardizing anything more than data dictionaries, you may be sucking the life out of your competitive energy.



A black and white photograph of a man in a striped shirt sitting at a desk in a dark office. The man is looking towards the camera with a serious expression. The lighting is dramatic, with strong highlights on his shirt and face, and deep shadows in the background.

# System inte Response to IS customer

© 1990 LEGENT. All rights reserved.  
LEGENT is registered in U.S. Patent and Trademark Office.

egrity is being questioned.  
time is degrading.  
ers are considering alternatives.

Improve service. Increase productivity. Reduce costs.

These problems follow IS managers wherever they go.

There's never been a better time to be an IS executive. Today, LEGENT Corporation is supplying the technologies and strategies that successfully support the "do-more-with-less" objectives of IS Management.

With LEGENT technologies, many IS managers are quantifying and assessing their entire environment. Then they further exploit LEGENT solutions to automate and improve datacenter performance, enhance system and network productivity, and automate and manage the application development life cycle. Resulting in increased productivity, improved user service levels, and a reduction of overall IS costs.

IS Management. Performance Management. Operations Management. Software Management. And Network Productivity. Five technologies from one company committed to building an effective partnership to ensure the success of the IS enterprise.

For more information, call LEGENT at 1-800-326-1992.

  
**LEGENT**



# SYSTEMS & SOFTWARE

## COMMENTARY

Rosemary Hamilton

### Only a matter of time



Not many vendors could get a few hundred users to attend a conference in honor of a product that virtually none of them have. Guess which one recently did?

Earlier this month, more than 300 people attended the first Repository and AD/Cycle conference in Chicago. While IBM didn't sponsor the event, it was IBM's product and strategic direction for application development that brought those scores of people there.

What was striking was the number of users who said that a commitment to AD/Cycle is pretty much a done deal at their companies. AD/Cycle, announced in September 1989, is IBM's plan for application development. It includes a core piece of software, Repository Manager, that provides both the guidelines for application development — represented in the often-talked-about information model — and functions to manage the development environment. AD/Cycle also greatly depends on third-party software that will connect to Repository Manager and serve as development tools.

Some R/AD attendees said they do not yet fully understand what AD/Cycle is all about. Others doubt there will be any real evaluation of AD/Cycle alternatives. Heck, one user didn't even have DB2 installed yet. But they were all saying that it is only a matter of time before

*Continued on page 40*

## Taking a RISC to pick up some speed

### ANALYSIS

BY J. A. SAVAGE  
CW STAFF

The next generation of reduced instruction set computing (RISC) machines will reportedly hit speeds of nearly 80 million instructions per second with one processor. To make processors that fast, vendors are implementing two methods to send more instructions through the processor for each cycle. The buzzwords associated with improvements in the next generation of RISC processors are "superscalar" and "superpipelining." Each vendor will also increase its processor clock speed from 33 MHz to 50 MHz.

"Think of a two-lane highway," said Howard Sachs, vice-president and general manager at Intergraph Corp.'s Advanced Processor Division, who used cars as an analogy for the com-

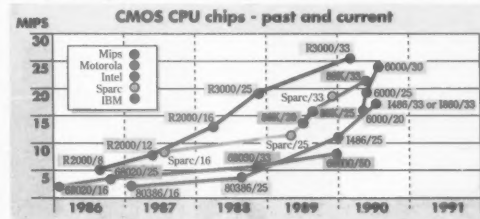
puter's instructions. "If you meter the cars' access to the highway, you get a lot of cars on the road, and they won't crash into each other. That's pipelining." He described superscaling as adding more lanes and scheduling the cars into other lanes.

Before implementing these new facets of technology, all vendors are speeding up their CPU clock speeds. The simplest RISC processor sends instructions through the CPU at a rate of one per clock tick. Thus, the simplest method to speed up the instruction rate is to speed up the clock.

Vendors said, however, that relying on increases in clock speed has not been that dependable in manufacturing because of the trial-and-error method of producing high clock-speed chips. The last generation of RISC CPUs was often hand-picked to get the current average of 33 MHz, said John Ma-

### Power pack

RISC processing power is more than five times what was available in 1986



Source: Mips Computer Systems, Inc.

CW Chart: Paul Mock

shey, vice-president of systems technology at Mips Computer Systems, Inc. Handpicking chips made the process less predictable and more expensive.

Vendors plan on using either superpipelining, superscalar techniques or both on top of a faster clock. With superpipelining, instructions are sent at every fraction of a clock-tick through the cycle. Of all the

RISC vendors, Intergraph Corp. is the only one who has committed to superpipelining, and it is matching it with superscalar. Mips will not commit either way.

With Sun Microsystems, Inc.'s Scalable Processor Architecture (Sparc), there is no single method used to speed up the chips. Unlike the rest of the chip vendors, Sun allows its semicon-

*Continued on page 45*

## D&B steps into cooperative processing

BY MARYFRAN JOHNSON  
CW STAFF

FRAMINGHAM, Mass. — Dun & Bradstreet Software rounded its product line last week by announcing six products for Digital Equipment Corp. VAXs and IBM workstations and mainframes, including new financial applications, relational database software and a workstation-based development tool.

The IBM workstation tool, Frontline Viewbuilder, is the first tangible sign that D&B Software is moving beyond merely enhancing the two product lines it inherited earlier this year in the merger of Management Science America, Inc. and McCormack & Dodge Corp.

Other products announced last week included a Human Resources DB2 package for payroll and personnel that is designed to run under the IBM 370 and 390 architectures and three financial applications in the Millenium line for DEC VAXs.

### A solid step

"The idea of Frontline is definitely a step in the right direction for D&B and seems like a natural step toward their future architecture," said Stuart Woodring, director of software strategy research at Forrester Research, Inc. in Cambridge, Mass. "But we're going to see D&B continue to do its old business for a couple years."

Frontline Viewbuilder is a de-

velopment tool that allows customers to build stand-alone or cooperative processing applications. Specific functions such as data entry can be moved from the mainframe to an IBM Personal System/2 or Personal Computer AT, which can interface with an IBM or DEC host.

Real estate syndicator JMB Properties in Chicago has been using Frontline in beta testing for the past year to downsize property management applications from an IBM 4381 low-end mainframe to IBM PC ATs.

"We had limited use for Frontline when we brought it in, but now we've found three other main uses," said Mike Coxhead, assistant vice-president of MIS.

JMB is developing front-end

applications to preprocess information on PCs before shipping it to the mainframe, as well as prototyping a PC-based stand-alone application to track property management, Coxhead said. In addition, JMB is using the development tool to build interactive mainframe/PC applications for uses such as security administration.

At Jet Propulsion Laboratory in Pasadena, Calif., senior systems analyst Bill Dunigan is using Frontline to develop applications for procurement and human resources administration.

"I needed a way to set up screens easy enough for casual users who aren't exposed regularly to the mainframe," said Dunigan, who runs Millenium applications packages on an IBM

*Continued on page 44*

## NAPERSOFT

NAPERSOFT, Inc.  
One Energy Center  
Naperville, IL 60563-8466  
708/420-1515

### Treats Customers Write

NAPERSOFT® Automated Correspondence Software handles your written communications to customers quickly, accurately and professionally with:

- On-line or batch letter writing
- On-line notepads
- Spell checker
- On-line letter history
- Full function word processor
- Full printer support

With your IBM mainframe and NAPERSOFT software you can streamline your customers correspondence! NAPERSOFT... for businesses that treat customers write.



FIRST  
CLASS  
SERVICE



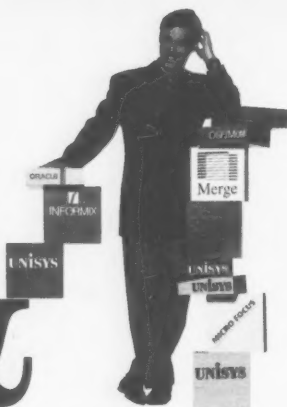


# UNIX gives you flexibility.



multiple processor  
up to 80 users.

&



**Software**  
50 popular software packages from  
30 independent vendors packaged  
as a comprehensive solution platform.

&



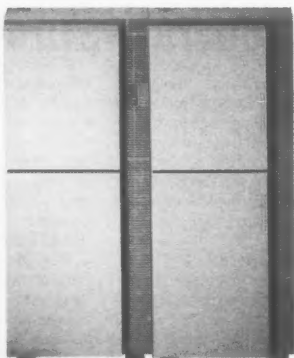
**U 6000/10**  
The low-end UNIX based server.  
Up to 16 users.

&



ance with a wealth of  
up to 80 users.

&



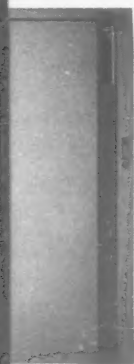
**U 6000/80**  
The large-scale multiple processor  
server. Up to 400 users.

&



**Customer Education**  
Custom and standard courses improve  
effectiveness of UNIX based systems  
installations.

&



ance. Lots of applications.  
Up to 128.

&



**S 4040**  
The choice of resellers. It serves  
up to 46 users.

&



**U 6000/60**  
The mid-range server. Up to 64 users.

&

# Unisys gives you more.



#### VAR

Unisys provides aggressive support programs for VARs so customers receive quality application solutions.



#### U 6000 Workstation

The general purpose workstation with the advantages of industry standards, MS/DOS & UNIX operating system.



**Professional Services**  
Exclusive implementation and contingency services for each customer.

Your enterprise needs to get the most out of UNIX systems. And that means more than just boxes.

True, Unisys offers the most comprehensive family of software-compatible commercial UNIX based systems. So you can integrate your enterprise with PCs, workstations, network servers, and powerful multi-processors.

But you need more. So we offer over 1,000 applications. They cover a wide range of industries and run across a vast array of platforms; that gives you interoperability, increases productivity and reduces conversion, development and training costs.

What's more, there's more service and support. Like 37 Unisys Solution and Portation Centers to port your applications over to UNIX based systems.


In short: More flexibility. More interoperability. More productivity. What more can we say? To find out, call 1-800-448-1424, ext. 50. As you might expect, we want to talk some more.

©1990 Unisys Corporation. UNIX is a registered trademark of AT&T. Merge is a trademark of Locus Corporation. Oracle is a trademark of Oracle Corporation, Redwood Shores, CA. OFS, Motif is a trademark of the Open Software Foundation, Inc. Micro Focus is a trademark of Micro Focus, Inc. Informix is a trademark of Informix, Inc. DECnet is a registered trademark of Digital Equipment Corporation.

See us at UNIX Expo, Booth #623.

# UNISYS

## We make it happen



# You'll choose our financial software for its technology, but you'll keep it for its fit.

In evaluating financial software for your company, consider this: the technology you buy today is only as good as its ability to furnish your needs tomorrow. Which is why so many corporate leaders have chosen SAA-compliant DB2 applications from Walker Interactive Systems.

In fact, only Walker has the technology to give your company a functionality fit from the start. That's because our unique architecture lets you completely personalize your Walker applications for your business. And no matter how much, how often, or how quickly things change, Walker will keep you operating comfortably.

Just ask any of our clients. While they've grown and prospered, we've become stronger, more focused, and uncommonly consistent.

So give Walker a call, and find out how a good fit today can put your company in a lot more comfortable position tomorrow. Call (415) 495-8811 for more information.



Walker Interactive Systems™

# State Department looks to the STARS

## ON SITE

BY GARY H. ANTHES  
CW STAFF

WASHINGTON, D.C. — When Marilyn Quayle received an invitation last month to meet with a delegation of Soviet officials to discuss disaster relief, the request came through the U.S. Department of State. An ambassador at the State Department had a vague recollection of earlier contact between the Vice-President's wife and Soviet officials, and he wondered if there might be a connection between the two meetings.

Within seconds, he had the answer. Searching through 58G bytes of document images stored in an optical disc jukebox, the ambassador found a 1989 memo that transmitted briefing materials to the White House for a similar meeting Quayle hosted for Soviet officials in the wake of the Armenian earthquake.

Ambassador J. Stapleton Roy, executive secretary of the De-

partment of State, used the Secretariat Tracking and Retrieval System (STARS), which indexes, tracks and retrieves congressional correspondence, foreign policy memos, letters and other important documents going to and from the secretary of state and his six senior deputies.

### Backup memory

STARS replaces a cumbersome, partly manual system and the faulty memories of its users. It resides on a Wang Laboratories, Inc. VS 10000 Model 100, the company's largest machine, with 40 Wang imaging workstations attached. A nearly complete array of Wang office automation products coexists on the computer — including such things as electronic mail, word processing, and PACE, Wang's relational database management system and application-development tool. The applications are integrated so that, for example, a word-processing user can retrieve data from the database, put it in a document and then

send the whole thing to another user via E-mail.

The State Department scans 35,000 documents annually, averaging five pages each, into STARS. Documents are scanned, indexed and stored on on-line magnetic disks for approximately four weeks. They are then moved to write-once read-many (WORM) optical discs stored in an optical disc jukebox that can hold 176G bytes of data.

STARS users find their requested documents on magnetic disk 90% of the time, said Dan McLe, director of information resources management within the Executive Secretariat. Requests automatically routed by STARS to the jukebox take 15 to 18 seconds to serve, ac-

cording to McLe.

STARS is attached to a local-area network accessible by people with top-secret clearances. The VS 10000 and data storage devices are housed in a shielded room with ties to external termi-

vided by STARS is also useful. If the White House complains that it's taking too long to draft a reply to a letter — "a not unheard-of experience" — he can use the system's document tracking feature to pinpoint bottlenecks in the State Department's labyrinthine system of document drafting and approval.

Roy said he uses STARS "all the time," only asking a secretary to do searches when they can be precisely defined. But he said the system is not used by those at the highest levels of the State Department very much. "Most senior officials are of an age that they are computer-illiterate," he said. Part of his challenge is to tailor the technology to the temperament of those officials.



State's Roy sees in STARS a qualitative step up

nals via fiber-optic cables.

STARS replaces a Computer Corporation of America Model 204 application running on an IBM mainframe. When queried, that system gave indexes only; users would then have to use the pointers to look up the desired documents on microfilm. "It could take from 10 minutes to two hours to get an answer to a question," McLe said.

STARS offers a qualitative improvement in information retrieval, Roy said: "If you can't recover a document quickly enough, you may be tempted to rely on your memory. Every issue has a history, and the history has a document trail. You ignore history at your peril."

Roy said he gets many vague requests. "I'll get a call from Secretary [of State James A.] Baker saying, 'Didn't I get something from the President on this?' Or I might be asked to determine what instructions were given to a particular embassy at a particular time. I need to react quickly." STARS shrinks response time from hours to minutes, he said.

Roy said the audit trail pro-

vided by STARS is also useful. If the White House complains that it's taking too long to draft a reply to a letter — "a not unheard-of experience" — he can use the system's document tracking feature to pinpoint bottlenecks in the State Department's labyrinthine system of document drafting and approval.

STARS replaces a cumbersome, partly manual system and the faulty memories of its users.

STARS replaces a cumbersome, partly manual system and the faulty memories of its users.

with software and people. "We move people all around the world. We don't want a secretary to go from Bangkok to Rome and have to learn a new system," he said. Wang gives the department superb service, possibly because it is the bluest of Wang's blue-chip accounts, McLe said.

However, McLe said, as Wang moves to open systems, he worries that support for the proprietary products may wane: "We may not get the enhancements to the older systems and applications that we need."

## Legent takes steps to flesh out SMS

BY SALLY CUSACK  
CW STAFF

PITTSBURGH — Moving to fill what it claims are gaps in IBM's system-managed storage (SMS) architecture, Legent Corp. recently introduced a storage performance manager for the IBM MVS environment.

Astex Release 1.0 complements SMS and is designed to locate, identify and recommend solutions for I/O response time delays, as well as ensure efficient use of cache and direct-access storage device (DASD) resources, according to Legent.

IBM's SMS strategy represents an evolution from labor-intensive user-managed storage to automated storage management.

"The performance side of SMS lacks a few pieces, and Astex is plugging those in by pro-

viding performance measurement at the data-set level," said Greg Such, product manager at Legent. According to Legent, Astex operates in both SMS and non-SMS environments.

### Three-part harmony

Astex consists of three components: Storage Manager, which maintains and improves end-user response time by recommending solutions for proper data placement across the storage hierarchy; a Cache Manager, which provides analysis, automatic optimization, cache simulation routines and data set cache statistics; and DASD Manager, which ensures optimal use of DASD resources.

Hoot Gibson, systems programming specialist at L. L. Bean, Inc., a retail and mail-order outdoor sporting specialties company in Freeport, Maine,

has been running Astex as a beta user for a little over a month and said the product "helps quite a bit." L. L. Bean is running Astex on an IBM 3090 600E platform under the MVS/ESA operating system and, according to Gibson, has already been able to convert some volumes to SMS using the Legent product.

"The cache optimizer has allowed us to take some volumes off of cache by identifying what was being overutilized," Gibson said. DASD response time has also improved, he added.

According to Nick Allen, an analyst at Gartner Group, Inc., Astex is valuable in helping a user to determine if the system is "overcached."

Pricing for Astex Release 1.0 starts at \$15,000, based on CPU class, and the product is said to support all IBM and non-IBM DASD and cache controllers.

## What IBM Can't Tell You About TSO.

1. How to cut TSO overhead by 47%

2. How to put CICS on ISPF menu.

3. How to concurrently have 3 ISPF's plus SDSF, INFO/MVS, RMF, DB2, SAS, QMF, and OMEGAMON on your terminal, with a single TSO ID in your TSO address space.

Since 1984, hundreds of companies worldwide have selected MultiTSO™ to improve TSO performance and productivity.

Call for more information and a **FREE** 30 day trial.

**Technologic Software Concepts, Inc.**

16842 Von Karman - Irvine, CA 92714  
(714) 863-7080  
FAX (714) 863-7055



## Users praise Oracle's order-form software

BY JEAN S. BOZMAN  
CW STAFF

REDWOOD CITY, Calif. — Suppose you wanted to create an order-entry application that pries data out of an Oracle Systems Corp. database. Then suppose you could not write procedural code. That would be a good time, users say, to turn to Oracle's SQL\*Forms, a 5-year-old computer-aided software engineering tool installed at most Oracle database management system sites.

Managers can use SQL\*Forms to create order-entry forms by example. The software makes it possible to assemble screen elements, such as pull-down menus and pop-up windows, without having to write the underlying code. The procedure is called "declarative specification," said Sohaib Abbasi, director of tools development at Oracle.

"We give users the high-level objects that handle the mapping [of data] from the database itself onto the user interface," Abbasi explained. "Once an application is developed using SQL\*Forms, it can be deployed into any computing environment Oracle supports."

### Widely used

First introduced in 1985, SQL\*Forms is now used by more than 90% of all Oracle DBMS shops, Abbasi said. Sentry Market Research in Westboro, Mass., estimated that 20% of Digital Equipment Corp. VAX sites use SQL\*Forms, based on a survey of 331 firms.

SQL\*Forms Version 2.3 is compatible with Version 5.0 of the Oracle DBMS; SQL\*Forms Version 3.0 requires the use of the current Oracle Version 6.0 DBMS.

Experienced Oracle users say that by doing away with writing repetitive systems calls, SQL\*Forms makes programmers more productive and development more efficient.

"It's used all the time," said Warren Capps, president of the Virginia-based Mid-Atlantic Oracle Users Group. "There certainly are those shops that don't use SQL\*Forms at all. They use C to write their own interface to the Oracle DBMS. But most people use SQL\*Forms, and they use it happily."

Few users questioned by *Computerworld* wanted to trade in their 2-year-old SQL\*Forms Version 2.3 software for the new and improved SQL\*Forms Version 3.0 that began shipping to VAX sites last December.

"There's no pressure on me to upgrade from SQL\*Forms 2.3," said Bruce Campbell, a software developer at Microtel Pacific Research in Vancouver, B.C. "There are hidden costs of

converting to SQL\*Forms Version 3.0, including the cost of interrupting business and providing training."

SQL\*Forms Version 3.0's new features include PL/SQL, a procedural language extension to industry-standard SQL. The inclusion of PL/SQL is intended

to give skillful programmers a way to extend the functionality of an SQL-Forms application. Version 3.0 also supports a standard look-and-feel interface across multiple hardware platforms and supports many graphical user interface-like features, such as pop-up windows. However,

er, SQL\*Forms Version 3.0 remains a character-based interface and lacks support for on-screen icons.

### Lacks speed

Some users who have tried SQL\*Forms Version 3.0, including Campbell, say they believe it is running more slowly than Version 2.3, the previous release. That finding does not surprise

some industry analysts.

"Since Oracle dominates its market, it tries to stuff too many features into its new products, such as SQL\*Forms 3.0," said Paul Cabbage, director of Unix market research at Dataquest, Inc., in San Jose, Calif. "Oracle isn't famous for a new release of software being terrific. They kind of push it out there and keep improving on it."

## In The Complex World Of A Simple, Practical



## Users blame Prime for Oracle delay

BY MAURA J. HARRINGTON  
CW STAFF

NATICK, Mass. — The task of porting popular third-party software products to proprietary systems can be tricky, as Prime Computer, Inc. has learned in its efforts to bring Oracle Systems

Corp.'s Oracle Version 6.0 relational database management software compatible system to its Primos 50 series minicomputer platform.

Prime, which has been writing its own port for Oracle since 1985, has been having difficulties with the latest revision of

Version 6.0, which includes an SQL report writer.

The revision was due out in full almost six months ago. However, Prime has only managed to port part of the new release and recently told users it would not have the latest revision of Version 6.0 — which has been out

for several months on other platforms — until January 1991 at the earliest.

Prime also said that monthly maintenance fees for the latest version's release will increase 100% to 600%. The increase will be necessary because the company has unbundled the services in an "effort to mainstream our maintenance policy with the rest of the industry," according

to Perry Bent, Prime's Oracle product marketing manager.

Although Prime's user base of Oracle on its proprietary platform is slightly more than 5% of its total customer base, Bent said, the delay in the newest version of Oracle, which was officially released by the company approximately a year ago, is not a result of Prime assigning it a low priority.

The delay, he said, occurred because the SQL report writer was not written in Oracle's standard port writing code as it usually is.

Nevertheless, users who are running Oracle on their Prime systems claim they are disappointed with Prime rather than with Oracle because of the delay.

One Prime user who is an information systems manager for a city in Southern California and runs Oracle Version 5.1 said he is fed up with the older version but cannot get a hold of the new one.

Another Prime and Oracle

# Information Management, Solution Has Emerged.

Introducing the Information Management Software solution from Computer Associates. It's built around three basic ingredients.

Proven, high performance database management systems.

Comprehensive software engineering solutions.

And the most important ingredient of all:

Availability.

Everything you need—everything you've been told you had to wait for—we have ready and available today.

Our relational database technology doesn't need to "mature."

CA-IDMS®/DB and CA-DATACOM/DB® support mission-critical applications at thousands of sites around the world.

In addition, CA's software engineering solutions are the most complete and tightly integrated available. They include the industry's most successful COBOL development environment, 4GLs, and application generators. With facilities to manage testing, maintenance, implementation and change control.

And with our Computing Architecture For The 90s, you'll be able to achieve distributed processing across the widest range of multiple operating systems and hardware platforms. And our unique transparency software is only one of the ways CA90s protects the tremendous investment you've made in your present applications.

Altogether it's a simple, practical solution you can benefit from just when you need it the most.

Today.



CA's Computing Architecture For The 90s protects and enhances the value of every CA software solution.

COMPUTER  
ASSOCIATES

Software solutions by design

For more information call 1-800-645-3003.  
© 1990 Computer Associates International, Inc.,  
711 Stewart Avenue, Garden City, NY 11530-4787

**T**HE DELAY IN the newest version of Oracle is due to the fact that the SQL report writer was not written in Oracle's standard port writing code.

user who works for a large utilities company in the Midwest said that the company runs its Oracle RDBMS on a personal computer because it wants to avoid the "hassle of dealing" with the Prime version.

"We do have a license to run Oracle on our Prime system, but we needed to run Version 6.0, and Prime didn't have it, [so we went with a PC version]," said the user, who is a systems developer at the utilities company.

While the inability to complete the port for Oracle's latest revision of Version 6.0 presents a problem for customers and ultimately for Prime, Wayne Kernochan, senior analyst of distributed systems at The Yankee Group, said that the problem could be the outcome of several other internal difficulties.

For example, the company has recently experienced a large layoff program, a senior management reorganization and a dying minicomputer market, Kernochan said.

"I think some of the problems [Prime] has had have caused some of the good developers to leave, perhaps," said Paul Cubbage, an analyst at Dataquest, Inc., a market research firm based in San Jose, Calif.

Nevertheless, Kernochan said, in the case of Prime, perhaps the company attempted too much, too late.

# SCSI continues its impressive run

*Citing speed, addressing capability, supporters say bus will dominate*

BY ELLIS BOOKER  
CW STAFF

There's nothing small about the importance of the small computer systems interface (SCSI), say vendors who have pushed the standard and analysts who have watched it evolve since 1982.

Most recently, long-time SCSI booster NCR Corp. made SCSI the interface of choice across its System 3000 line of Intel Corp. X86 computers. Apple Computer, Inc. has supported the bus for years across its product line, but virtually every computer company and many peripheral device manufacturers support SCSI for peripheral gear which requires high data throughput.

Why do its backers say the SCSI bus will become the dominant method of connecting computers to all sorts of peripheral systems, from optical disks to parallel disk arrays? The answer rests on two features of the interface. First, SCSI is fast. The current implementation specifies a 5M byte/sec. data transfer rate, and a follow-up standard specifies a 20M and 40M byte/sec. rate, respectively.

Second, SCSI uses logical rather than physical addressing; a "logical unit" may coincide with all or part of a peripheral device. This feature may allow it to play a key role in high-speed, fault-tolerant computer architectures under development.

"Virtually everyone is using

SCSI in one place or another," said John B. Lohmeyer, senior consulting engineer at NCR and chairman of ANSI X3T9.2, the committee that develops SCSI standards.

Part of the reason for slow acceptance of SCSI for IBM and compatible personal computers has been the lack of a common command set for SCSI adaptors and devices, Lohmeyer said. This has resulted in a situation whereby an SCSI adapter, which in theory can connect to multiple peripherals, is commonly configured to one peripheral at a time.

However, Lohmeyer's committee has proposed a subset of 18 commands, known as the common command set, as part of its work on the SCSI-2 standard. The command set "should normalize the software layer for [device] drivers," he explained.

## No waiting

The basic SCSI-2, approved by the American National Standards Institute in late August, has already started showing up in products. For example, NCR recently unveiled an \$8,000 SCSI laser printer that it claims can operate seven times faster than a laser printer attached to a standard parallel port and 100 times faster than an RS-232 serial port.

"We see [SCSI] as very important for image input and output," said NCR Senior Vice-President and Chief Scientist Philip M. Neches. He noted, for

instance, that most of the time taken by a laser printer to print a page of graphics is spent transferring data from the computer to the printer over a 19.2K bit/sec. parallel interface.

The System 7000, the 100,000-million instructions per second loosely coupled parallel system NCR hopes to deliver in 1992, will possibly have multiple SCSI ports per processor, Neches said.

In the short term, one of the most promising areas for SCSI will be in support of parallel disk arrays. In this arrangement, groups of storage devices are attached to a SCSI bus. The benefit is that a data file can be spread across multiple disks.

"Your transaction rate is limited by the disk drive," explained Mike Anderson, director of storage systems engineering at Micropolis Corp. in Chatsworth, Calif. A single drive may have an I/O of 40 transactions per second, "but if you string 10 drives together you get in the ballpark of 400 I/Os per second."

This configuration can also be used in fault-tolerant architectures. One of the attached drives can act as a parity check, enabling the system to reconstitute data if one of the drives fails.

Will SCSI dominate among disk drive interfaces for non-Apple microcomputers? Mike Casey, director of storage industry research at Gartner Group/Info-corp, Inc. in Santa Clara, Calif., believes this will come down to

whether IBM and its closest competitors find a reason to commit to SCSI across their entire product line. To do so, he noted, will mean either offering SCSI adapter cards for the PC's system bus — using up a card slot in the process — or adding SCSI electronics to the PC's

motherboard and creating a dedicated SCSI port at added cost.

Neither approach, he reasoned, makes economic sense if the computer will be configured for a single hard drive. "But once you know you need two or more drives, then SCSI makes all the sense in the world," he said.

## Come together

There are four distinct configuration possibilities with SCSI:

- Single Host/Single Controller.
- Single Host/Multiple Controllers.
- Multiple Hosts/Single Controller.
- Multiple Hosts/Multiple Controllers.

The current SCSI specification is a 5M byte/sec., eight-port bus, supporting asynchronous and synchronous data traffic.

Two future iterations of this standard, which was adopted by ANSI in 1986, will significantly increase its data transfer rates. SCSI-2 adds scanning devices and optical memory devices, as well as CD-ROM and network interfaces, to the list of devices supported by SCSI-2. In addition, it expands the bandwidth of the standard with support for 16- and 32-bit bus architectures capable of 20M byte/sec. (SCSI "Fast") and 40M byte/sec. (SCSI "Wide"), respectively. Such throughput will be vital, many think, if I/O is not to become the logjam for next-generation, high-speed computers running at thousands or even hundreds of thousands of millions of instructions per second.

The next jump in the standard will be SCSI-3, which will call for more than eight devices per bus and a fiber-optic interface option. SCSI-3 is now in proposal form before the X3T9.2 committee.

A little history: In 1981, Shugart Associates, in the company of NCR, submitted Shugart Associates System Interface (SASI), an intelligent interface for disk drives, to the ANSI X3T9 standards committee. Renamed the small computer systems interface (SCSI) in 1982, the standard was approved by ANSI in June 1986. The first SCSI protocol chip, developed by NCR in 1983, was added to the Smithsonian Institution's permanent collection this past summer.

ELLIS BOOKER

## Hamilton

FROM PAGE 33

their companies would adopt AD/Cycle.

It is discouraging that any company can still carry that kind of clout and that some users would suggest that they plan to license a product and adopt a strategy just because of who and what that company is. This is not to suggest that it is disappointing that people plan to buy from IBM. But it is unfortunate that they'd do so without full-blown competitive evaluations.

These days, when you talk to users, they often say it does not make sense to just go along with IBM anymore. They say it makes sense to hold IBM to a high standard and demand answers, products and a delivery schedule that meets their needs. It makes even more sense to check out what the competitors are offering, they say.

So, what's going on here? A trip back in time?

Let's hope not. The bottom line is, if users do not take more control of application development strategy and instead sim-

ply follow IBM's lead, they stand less of a chance of getting exactly what they need.

This simply comes down to the old story of a competitive marketplace resulting in better products for users. There are some early signs that this might not happen when it comes to application development.

Take, for example, the information model, the key piece to Repository Manager, which will provide the guidelines for ap-



plication development. While early users of Repository Manager reportedly have been giving IBM feedback on the product, its information model continues to be crafted by IBM and its business partners, not users. What's more, users still do not have easy access to it. If they want to check out the information model specifications, they are required to license Repository Manager.

However, the typical user at the R/AD conference was very

new to the AD/Cycle world. One could assume that they are in no position to challenge or push IBM until they fully understand what is going on.

Further, conversations with some more advanced users — namely, a couple who actually have Repository Manager installed — showed a more aggressive attitude toward IBM. It was one of those users, in fact, who first raised the issue of a different data model between AD/Cycle and Systemview. He was far from shy about indicating his disappointment.

So, to put a positive spin on this, one could assume that it is still too early for users to call the shots. Once they learn more about AD/Cycle, and once they come closer to actually installing products, they may get tougher.

We can't ignore the negative side to this, though. There have clearly been a few warning signs that users are not directing the application development movement as much as they should be.

Hamilton is a *Computerworld* senior editor, systems and software.

## SOFT NOTES

### Pansophic, Martin sign deal

**Pansophic Systems, Inc.** signed a cooperative marketing deal with **James Martin Insight**, a division of James Martin Associates, Inc., to provide computer-aided software engineering (CASE) products that blend the Pansophic tools with the James Martin methodologies. The two companies plan to provide versions of Martin's IE-Expert for Pansophic CASE products. IE-Expert provides an automated approach to Martin's information engineering methodology.

**TRW Financial Systems, Inc.** agreed to port its Insurance Image Transaction System to **Hewlett-Packard Co.'s** Advanced Image Management System. A TRW Information Systems & Services unit based in Berkeley, Calif., TRW Financial Systems has been providing imaging applications since 1978. Both TRW and HP will market the application to midsize life insurance companies within the U.S.

**Kapiti, Inc.** said it has integrated its Financial Information Systems Toolkit with **Dectrade, Digital Equipment Corp.'s** trading system platform. Kapiti sells trading room and wholesale banking systems.

**Bachman Information Systems, Inc.** signed a deal with **IBM** to sell its re-engineering products overseas. **IBM Asia/Pacific** plans to resell the **Bachman/Re-Engineering Product Set** in eastern Asia. Meanwhile, **Bachman and IBM Japan** plan to translate the **Bachman** product into Japanese.

**Compuware Corp.** announced a licensing agreement with **IBM** that will allow **IBM** to incorporate **Compuware's** CICS region analysis technology into the **IBM CICS Problem Determination/MVS** tool. The **IBM** tool is designed to diagnose and resolve CICS region failures in CICS/ESA environments. **IBM** is scheduled to ship its product in December.



## A Comparison Chart of the Major Cooperative Processing Software Products:

### FUNCTIONS:

	SUPER-LINK®	Easy™	Mozart™	Arbiter®	IBM's HLLAPI™	IBM's APPC™
<b>Processing Capabilities Supported</b>						
Peer-to-Peer Processing	✓	✓	✓	✓	✓	✓
Existing terminal-based systems	✓	✓	✓	✓	✓	✓
Mixed Peer-to-Peer and existing systems	✓	✓	✓	✓	✓	✓
Application integrity/Software Distribution	✓	✓	✓	✓	✓	✓
SAA/CUA Interface compatibility	✓	✓	✓	✓	✓	✓
<b>Workstation Environments Supported</b>						
PC/DOS	✓	✓	✓	✓	✓	✓
OS/2	✓	✓	✓	✓	✓	✓
PC/DOS to OS/2 application compatibility	✓	✓	✓	✓	✓	✓
LAN Server for shared applications and data	✓	✓	✓	✓	✓	✓
Multiple transaction servers on a LAN	✓	✓	✓	✓	✓	✓
<b>Development Environment Comparison</b>						
Object orientation	✓	✓	✓	✓	✓	✓
Dictionary and documentation	✓	✓	✓	✓	✓	✓
Panel/Form painter for creation/maintenance	✓	✓	✓	✓	✓	✓
3270 screen capture: picture and attributes	✓	✓	✓	✓	✓	✓
CASE/Application Generation	✓	✓	✓	✓	✓	✓
Intelligent (language-sensitive) editor	✓	✓	✓	✓	✓	✓
System and user-defined reusable code templates	✓	✓	✓	✓	✓	✓
Integrated compile/test/debug	✓	✓	✓	✓	✓	✓
Execution time source debugging	✓	✓	✓	✓	✓	✓
All development tools for DOS available in DOS	✓	✓	✓	✓	✓	✓
<b>Objects Supported</b>						
CUA display images	✓	✓	✓	✓	✓	✓
CUA dialog within display object	✓	✓	✓	✓	✓	✓
Validation within display object	✓	✓	✓	✓	✓	✓
Help processing	✓	✓	✓	✓	✓	✓
Error processing	✓	✓	✓	✓	✓	✓
Text window interactions	✓	✓	✓	✓	✓	✓
Business graphics	✓	✓	✓	✓	✓	✓
3270 definition	✓	✓	✓	✓	✓	✓
Interactions with 3270	✓	✓	✓	✓	✓	✓
Interactions with Peer-to-Peer	✓	✓	✓	✓	✓	✓
"Logon" Scripts	✓	✓	✓	✓	✓	✓
Application integrity/Software Distribution	✓	✓	✓	✓	✓	✓
<b>Local Data Access</b>						
Indexed files	✓	✓	✓	✓	✓	✓
dBase	✓	✓	✓	✓	✓	✓
Flat Files (random access)	✓	✓	✓	✓	✓	✓
Flat Files (sequential access)	✓	✓	✓	✓	✓	✓
Multiple read/write to files on LAN Servers	✓	✓	✓	✓	✓	✓
<b>High Level Functions Directly Available in the Language</b>						
Field-level context sensitive help	✓	✓	✓	✓	✓	✓
Optional user learning mode	✓	✓	✓	✓	✓	✓
Display and selection from:						
Indexed files	✓	✓	✓	✓	✓	✓
Sequential files	✓	✓	✓	✓	✓	✓
In-memory lists	✓	✓	✓	✓	✓	✓
Menu display and selection	✓	✓	✓	✓	✓	✓
Determining 3270 screen identification	✓	✓	✓	✓	✓	✓
Read/write to 3270 in a single command	✓	✓	✓	✓	✓	✓
Read/write to 3270 one field at a time	✓	✓	✓	✓	✓	✓
Determine dynamic 3270 attribute changes	✓	✓	✓	✓	✓	✓
Embedded user assistance (pop-up selection lists)	✓	✓	✓	✓	✓	✓
Data editing/validation:						
Data type/mark checking	✓	✓	✓	✓	✓	✓
Single range/limit check	✓	✓	✓	✓	✓	✓
Field/data driven range/limit check	✓	✓	✓	✓	✓	✓
Date formatting/validation	✓	✓	✓	✓	✓	✓
Validation against local and LAN files	✓	✓	✓	✓	✓	✓
Required fields	✓	✓	✓	✓	✓	✓
"Must Fill" fields	✓	✓	✓	✓	✓	✓
Zero not valid fields	✓	✓	✓	✓	✓	✓
<b>Peer to Peer Host Environments Supported</b>						
MVS-CICS	✓	✓	✓	✓	✓	✓
MVS-IDMS/DC	✓	✓	✓	✓	✓	✓
MVS/TSO	✓	✓	✓	✓	✓	✓
DOS/VSE-CICS	✓	✓	✓	✓	✓	✓
VM/CMS	✓	✓	✓	✓	✓	✓
DEC VAX/VMS	✓	✓	✓	✓	✓	✓
<b>Software Distribution Host Environments Supported</b>						
MVS-CICS	✓	✓	✓	✓	✓	✓
MVS-IDMS/DC	✓	✓	✓	✓	✓	✓
MVS/TSO	✓	✓	✓	✓	✓	✓
DOS/VSE-CICS	✓	✓	✓	✓	✓	✓
VM/CMS	✓	✓	✓	✓	✓	✓
DEC VAX/VMS	✓	✓	✓	✓	✓	✓

Every effort to present an accurate chart has been made, however no guarantee can be made (1/2/90). Super-Link® is a registered trademark of Multi Soft, Inc., Lawrenceville, NJ. Mozart™ is a trademark of Aspen Research. Easy™ is a trademark of Interactive Images, Inc. Arbiter® is a registered trademark of Tangram Systems.

Don't be Suckered, Pushed, or Intimidated into expensive OS/2 hardware just to get SAA/CUA.

Multi Soft delivers SAA/CUA on character based 640K DOS PCs.

Save over \$5000 per station, extend the life of your corporate hardware and software assets, and save millions of dollars!

From depressing 3270, 3101, 5250, or VT220 Screens, to SAA/CUA screens in minutes, Without Touching Mainframe Code.

To the End User, it's a sight for sore eyes.

To your tired Host Applications, it's a new lease on life.

Multi Soft's INFRONT/DS™ & EasySAA™ products enable rapid development of intelligent SAA/CUA cooperative processing applications on standard low-cost 640K DOS PCs.

In addition its INFRONT/SDF™ (Software Distribution Facility) maintains the integrity of your software applications, tables and data.

And its INFRONT/HPO™ product provides the full peer-to-peer cooperative processing capabilities of IBM's APPC (Advanced Program-to-

Program Communications) product for PC/host applications. However, instead of requiring the use of LU6.2 SNA sessions, it works over the LU2-based networks that are already in place. Both

standard, LU2-based SNA links, as well as asynchronous communications are supported.

Not even IBM offers that kind of support now. In addition all SUPER-LINK

based applications port without change to IBM's OS/2, PM, and LU6.2 strategic platforms.

**The SUPER-LINK® product family represents the leading edge, and by far, the only complete family of cooperative processing products.**

The Experts in Cooperative Processing

**Multi Soft, Inc.**

123 Franklin Corner Rd.  
Lawrenceville, NJ 08648  
800-888-4973  
609-896-4100  
Fax# 609-895-0072



14,000+ USERS WORLD WIDE



You can even add ICON Based Menus & Backgrounds on your CGA character based DOS PC in minutes!





# To Build Production-Ready It Takes Industrial-

## **PACLAN. Team Development From Design To Code On A LAN.**

PACLAN™ from CGI. PACLAN brings the power of a multi-user repository to a LAN. Which means that now a team of developers can build applications together, from design to complete code generation, on a network of PC workstations.

PACLAN goes well beyond CASE tools that focus on planning and analysis. Tools that lack multi-user controls or run out of steam when it comes to code generation. PACLAN is industrial-strength CASE.

© 1990 CGI Systems, Inc. PacLAN is a trademark of CGI Systems, Inc.



# Applications On A LAN, Strength CASE.

Its power comes from an active, multi-user repository that drives the entire process. So you get real integration across the life-cycle, not just the passing of files from one phase to the next. PACLAN also provides full version control and change management across applications and workstations. Plus the horsepower to generate and maintain COBOL applications directly from specifications for over 30 target environments.

To find out more about PACLAN call 1-800-PAC-1866. For serious heavy-duty application building it doesn't make sense to waste time with anything else.

**CGI Systems.**  
**Industrial-Strength CASE.™**



## Product helps debug tangled C code

BY MARYFRAN JOHNSON  
CHIEF

SANTA CLARA, Calif. — Hindsight may be 20/20 when it comes to understanding past mistakes, but can it do something about tangled software code?

Advanced Software Automation, Inc. (ASA) is hoping its own Hindsight — a software maintenance tool introduced recently — will streamline the tedious process of analyzing, testing and debugging existing C language code.

"This is addressing the real issues that corporations face — maintaining existing code," said Les Hellenack, director of new software technologies at International Data Corp. in Framingham, Mass. "Maintenance issues take about 70% of a programmer's time. This helps the programmer save significant time in identifying the code requiring the maintenance, then performing that task."

Hellenack pointed out, however, that the product's avail-

ability only for C code could be a drawback for many commercial IS shops. "Those shops are still devoted to Cobol, and it will be much more complex to develop this kind of product for that environment," he said.

Company officials have said they will eventually introduce

similar products for Cobol and Fortran code. Hindsight is priced between \$12,000 and \$23,000 and is currently available from ASA.

As a back-end computer-aided software engineering tool, the product works with existing C code on Unix-based worksta-

tions from Digital Equipment Corp., IBM, Sun Microsystems, Inc. and Hewlett-Packard Co.'s Apollo division.

Hindsight requires no new methodologies, special conventions or techniques, company officials emphasized.

It incorporates a variety of software tools to provide automatic analysis, diagramming, code tracing, editing, quality

control and documentation.

In addition, graphic structure charts and active logic diagrams give programmers immediate feedback on any "ripple" effects from modifying a code module, according to the company.

"Hindsight graphically explains existing code and shows where it can be improved," said Tom McHugh, vice-president of marketing at ASA.



## IBM Introduces a Host of New Reasons for Choosing the SAS® Applications System

The world's leading applications system...  
already at work on IBM's new ES/9000 processors.

### D&B

FROM PAGE 33

3090 mainframe.

D&B's 3090 Human Resources DB2 package is an integrated relational payroll/personnel application designed to provide users with easier access to a corporation's human resources information. Neither of the previous human resources packages in the M&D or MSA lines worked with DB2.

When bought separately, the payroll and personnel components will each be priced from \$150,000. Current customers who want to upgrade their human resources package to DB2 capabilities can do so at prices starting from \$40,000.

The human resources package, scheduled to be available in December, is designed to take advantage of native DB2 capabilities such as set processing, concurrent processing and referential integrity.

#### Solid relationship

"These products are a positive sign. It should give customers that warm and fuzzy feeling that there is a valid relationship there [between the former M&D and D&B Software]," said Clare Gillan, an analyst at International Data Corp. in Framingham.

Capital Projects, available immediately and priced from \$20,000, provides on-line capabilities for tracking project progress. The purchase order package is priced at \$38,000. The accounts receivable application will cost \$47,000 and is slated to be available next month.



## NEW DEALS

## Hogan signs Germany deal

Hogan Systems, Inc. said it has signed a contract with B/S Visa Card Services GmbH of Frankfurt, Germany, to provide card-processing software and services. The Dallas-based software company said the contract is worth close to \$2 million.

The German Post Office, which is headquartered in Bonn, selected a Tandem Computers, Inc. Nonstop system for an electronic and physical mail distribution system. The contract is valued at \$1 million, according to Tandem.

Tandem also announced the sale of a four-processor Cyclone to Heidelberg Druckmaschinen in Wiesloch. The Cyclone mainframe will be used for warehouse, manufacturing and dispatch operations.

The company produces as many as 30 printing presses per day, and the Tandem system is reportedly handling as many as 120,000 transactions per day.

Intel Scientific Computers in Beaverton, Ore., said it has sold a parallel computer to the University of California in San Diego. The 32-processor IPSC/860 is the first result of an Intel project, which was helped along by a \$7.6 million grant from the Defense Advanced Research Project Agency. The goal is to develop a system with 2,048 processors by 1992.

## RISC

FROM PAGE 33

ductor partners to do whatever they want to the chip to make it function, as long as it follows basic Sparc guidelines.

Superscalar is the choice of Hewlett-Packard Co., IBM, Intel Corp. and Motorola, Inc. Superscalar sends two or more instructions through the processor at once. Each send is staggered, somewhat like singing a round of "Row, Row, Row Your Boat," where the instructions are in the same order, like the verse, but each tick of the clock yields a different mix.

IBM does this in its RISC System/6000, but the computer is tied to certain instructions and cannot pick them arbitrarily. In its next version of the processor, IBM will run eight to 10 instructions per cycle instead of four or five, thus giving the processor a wider range of computation, according to Phil Hester, director of IBM's Advanced Workstation Engineering Center.

For its next generation of processors, Intel will concentrate on broadening its superscalar implementation, according to Dick Pierce, marketing manager of the i860 chip.

Intel has a level of scalar in its current i860 processor, but it is limited to one general instruction and two floating point instructions per cycle.

## Clearing hurdles

Getting more instructions through the processor at one time is one hurdle, because with more instructions being sent at any one time, it becomes more difficult to make sure the processor remembers where it was in the cycle if it is interrupted by a high-priority request.

"It's one of the most subtle and hardest problems in making faster CPUs," Mashey said. If the CPU is not programmed to remember the place it was at in the multiple instructions coming through, it will either crash or come up with the wrong answer. This is where bugs come in that make CPUs late to market, said Mashey and sources from other vendors. The more complex the processor, the more chance for bugs, particularly in reacting to interrupts, Intel said.

Most vendors are expected to have their next RISC processors available in 1991, and executives said they think this is probably the last generation of uniprocessors to continue the double-performance-every-year continuum of RISC. Most future price/performance gains are expected to come from multi- or parallel-processing RISC CPUs. Digital Equipment Corp., Silicon Graphics, Inc. and Solbourne Computer, Inc. already have multiprocessors, and HP should have a multiprocessor RISC computer out by the end of the year.

## The Power. The Productivity. The Performance. Everything You'd Expect from IBM and SAS Institute. Plus One Thing More.

**A promise.** The SAS Applications System has everything you need to exploit the full potential of the new IBM Enterprise System/9000 family of processors.

No other software provides such a wide range of integrated applications...such common-sense user interfaces...such transparent data access...or such commitment to supporting the Enterprise Systems Architecture/390. And SAS Institute's ongoing commitment to the Systems Application Architecture is stronger now than ever before.

The SAS System also supports *vector processing*, which lets you run sophisticated analytical applications in less time...and gain better performance from system resources.

### Gain Total Control in Four Strategic Areas...on ES/9000 Processors and Beyond.

#### Data Access

- ☐ Full compatibility with ESCON and fiber optic channels
- ☐ Transparent access to the latest releases of DB2<sup>®</sup> and SQL/DS<sup>®</sup>
- ☐ Relational access to flat files, VSAM files, relational databases, or hierarchical databases.

With the SAS System, you can access data via relational views...just by calling a data view into your application using a single name. You don't have to know syntax or the internal structure of the data file.

#### Data Management

- ☐ SystemView support through a common user interface
- ☐ SQL support
- ☐ Data-handling utilities.

The SAS System lets you manage relational data with the industry-standard SQL language. It's easy to enter new data into the system...retrieve data as needed...and edit and query data files. You can even merge data from dissimilar files.

#### Data Analysis

- ☐ Unrivaled analytical capabilities including regression, analysis of variance, linear modeling, and more
- ☐ Reliable tools for business planning, forecasting, and decision support
- ☐ Specialized applications such as statistical quality improvement and matrix programming.

Regardless of your analytical needs—from computer performance evaluation to executive information systems—the SAS System is the standard by which other software is measured.

#### Data Presentation

- ☐ Automated and ad hoc report writing
- ☐ Business and analytical graphics
- ☐ Mapping
- ☐ Business correspondence.

### Take Advantage of Customized Interfaces for Both New Users and Power Users.

A task-oriented, menu-driven interface lets you interact with your data in an intuitive, "point and click" manner. There is no syntax to learn, nor complicated menu paths to navigate.

The SAS System also includes a command-driven programming interface. Experienced users and applications programmers can directly access the powerful SAS command language...and customize the programming environment with pull-down menus for file management, editing, and other essential tasks.

### Create Applications and Share Them with Virtually Any Other Environment—Quickly and Easily.

The SAS System offers a productive applications development environment. You can package a complete application and invoke it with a single command, and build menus and fill-in-the-blank screens for any application you choose.

What's more, the SAS System is portable across the entire range of computing platforms—from micro to mainframe and practically everything in between. That gives you the power to decide where a particular application belongs—in the data center, at the department level, on the desktop, or a combination of all three.

### Try the SAS System FREE for 30 Days.

With more than two million users worldwide, the SAS System is the leading applications system. And we back our software with the industry's most reliable technical support, documentation, training, and consulting services.

For more information about the SAS System, and to arrange your free 30-day evaluation, call your Software Sales Representative today at 919-677-8000 or fax us at 919-677-8123. In Canada call 416-443-9811.



SAS Institute Inc.  
Software Sales Department  
SAS Campus Drive □ Cary, NC 27513  
Phone 919-677-8000 □ Fax 919-677-8123

SAS is a registered trademark of SAS Institute Inc.  
IBM is a registered trademark, and "i" indicates a trademark, of International Business Machines Corporation.

Copyright © 1990 by SAS Institute Inc.  
Printed in the USA.

9/90



Authorized  
Cooperative  
Software  
Supplier

## NEW PRODUCTS — SOFTWARE

## Applications packages

Halberstadt & Company, Inc. has announced Release 2.0 of its Equipment Management System/400, a software application designed for IBM Application System/400 machines.

The product is a vehicle maintenance management information system that performs equipment repair history analysis, repair parts inventory control and purchasing, preventive maintenance scheduling and mechanic productivity analysis.

The product is priced between \$9,500 and \$20,000, depending on CPU size.

**Halberstadt & Co.**  
One Woodlawn Green  
Charlotte, N.C. 28210  
(704) 527-7940

System Software Associates, Inc. has announced Version 2.1 of its Business Planning and Control System (BPCS), a series that comprises 27 integrated application software products designed for use on IBM's Application System/400.

The BPCS supports multiple plant and multiple facility processing on one AS/400 database. Other features include support for centralized and decentralized operating functions, including customer order processing and general accounting.

Pricing ranges from \$3,000 to \$30,000, depending on hardware model.

**System Software Associates**  
500 W. Madison  
Chicago, Ill. 60606  
(312) 641-2900

Lawson Associates, Inc. has announced a version of its Pinstripe general-ledger software package designed for IBM Application System/400s and System/38s.

The product enables users to graphically display information and upload data from Lotus Development Corp.'s 1-2-3 spreadsheets and Symphony worksheets.

Pricing begins at \$20,000, and pricing for optional modules begins at \$4,000.

**Lawson Associates**  
1300 Godward St.  
Minneapolis, Minn. 55413  
(612) 379-0258

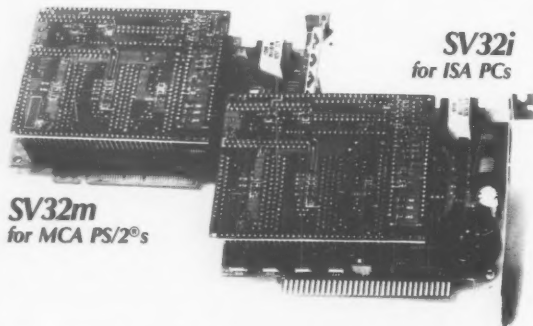
Allen Systems Group, Inc. has announced an automated job documentation application designed for users at IBM MVS sites.

Doc-Aid 3.7 features a scan facility that reduces the time needed to modify and standardize JCL, an audit trail reporting facility and an interface to Computer Associates International, Inc.'s CA-7 Prose facility.

Perpetual license fees range from \$27,000 to \$34,500, depending on site size.

**Allen Systems Group**  
750 11th St.  
S. Naples, Fla. 33940  
(813) 263-6700

## V.32 SNA ENGINES



Our SV32 SNA engines for PCs and PS/2s are designed to power very high speed SNA communications applications. Combining an SDLC adapter and a CCITT V.32 synchronous modem on a half-size option card, either SV32 model can run all of IBM's SNA connectivity software under DOS or OS/2® Extended Edition. And communicate with remote SNA hosts at speeds up to 12,000 bps over dial-up phone lines.

So to get your PCs, PS/2s, and portables equipped for real communications performance, install our SV32 SNA engines and get ready for a fast ride. For more information, call toll-free 1-800-444-1982, in Texas or outside the USA call 512-345-7791.

**MICROGATE**  
CORPORATION

See us at  
COMDEX Fall '90  
November 12-16, 1990  
Las Vegas, Nevada  
Booth #W022

MicroGate is a registered trademark of MicroGate Corporation. IBM PS/2, Micro Channel and OS/2 are trademarks of IBM Corporation.

## NEW PRODUCTS — HARDWARE

## Data storage

American International Devices, Inc. has announced a product designed to provide unattended backup for IBM Application System/400 9406 rack models.

The AI/T366 Intelligent Tape Array uses helical scan technology to record 6.6G bytes of data at a 716K byte/sec. transfer rate on three 8mm drives operating in parallel.

The device can be directly attached to an IBM 2602, 2607 or 2608 small computer systems interface. It is priced at \$48,600.

**American International Devices**  
12450 Beatrice St.  
Los Angeles, Calif. 90066  
(800) 243-4433

CFR Associates, Inc. has announced a plug-compatible device that can store 14G bytes of data on a single VHS cassette.

Megastor X was designed for multiple interfacing via IBM channels or Wang Laboratories, Inc. VS interfaces. The product features a maximum data transfer rate of 4M byte/sec. and is plug-compatible with several IBM mainframe and Application System/400 channel connections.

The price for a unit integrated with a 48-cassette handler is about \$200 per 1G byte. Megastor X is scheduled to be available in December in versions that include IBM mainframe channel and Wang VS interfaces.

**CFR Associates**  
18 Granite St.  
Haverhill, Mass. 01830  
(800) 237-9264

Alloy Computer Products, Inc. has introduced a network backup subsystem designed to provide up to 2.5G bytes of data storage on a single 8mm cartridge tape.

Retriever/2200 combines removable, rewritable magnetic media with a compact, integrated drive or controller and Alloy's Resqlan backup software package. It can be used for backups of Novell, Inc. networks, as well as personal computer-based local-area networks, 3Com Corp. and Banyan Systems, Inc. networks.

The subsystem is installed on a network node and enables data to be backed up unattended from any point on a network, the vendor said. It is priced at \$7,995.

**Alloy Computer Products**  
165 Forest St.  
Marlboro, Mass. 01752  
(508) 481-8500

Memorex Telex N.V. has introduced a reel-to-reel tape unit designed primarily for IBM Application System/400 environments.

The 5430 Magnetic Tape Subsystem is a front-loading, rack-mountable unit that can be installed in an AS/400 9309 or equivalent rack configuration without requiring any modifications to the AS/400's operating system or hardware.

The product is scheduled to ship next month and will have a list price of \$22,660.

**Memorex Telex**  
6929 N. Lakewood Ave.  
Tulsa, Okla. 74117  
(918) 274-5518

## I/O devices

Genicom Corp. has introduced a line of printers designed to function in IBM 3270; System/34, 36 and 38; and Application System/400 environments.

Models 3930 and 3940 are serial-impact dot matrix printers that operate at 600 character/sec., and Models 4570 and 4590 reportedly operate at 1,200 and 1,400 line/min, respectively.

Pricing ranges from \$3,795 to \$16,620, depending on model.

**Genicom**  
One Genicom Drive  
Waynesboro, Va. 22980  
(703) 949-1492



Talaris' 2090 Printstation

Talaris Systems, Inc. has announced a 20 page/min laser printer designed for multi-user environments.

The 2090 Printstation features three paper trays that enable users to print data on standard paper sizes ranging from half-letter to B size (11 in. by 17 in.). The product can run in duplex mode at a rate of 16 sides per minute, the vendor said.

The 2090 Printstation costs \$19,990.

**Talaris Systems**  
6059 Cornerstone Court West  
San Diego, Calif. 92126  
(619) 587-0787

NCR Corp. has introduced a small computer systems interface-based laser printer that operates at 15 page/min.

The NCR 6436-0301 was designed for graphics-intensive applications and has been targeted for users of personal computers in office printing or network environments. Its interface enables disks, tapes, printers and scanners to be connected to a shared I/O channel.

The product is priced at \$7,995.

**NCR**  
1700 S. Patterson  
Dayton, Ohio 45479  
(800) 225-5627

Interaction Systems, Inc. has announced its Crystal Clear line of touch screens designed to reduce glare, dispersion and diffusion of screen images.

The hermetically sealed unit can operate in extremely humid environments and preserves more than 95% of light transmission, the vendor said.

A 14-in. screen with a controller costs \$395 in OEM quantities of 1,000 or more.

**Interaction Systems**  
86 Coolidge Ave.  
Watertown, Mass. 02172  
(617) 923-6001

# Check out IBM's new Cross System Product.

- ☒ COBOL code generation
- ☒ SAA compliance
- ☒ PS/2 support
- ☒ Free AD/Cycle software



If you're shopping around for a better way to shrink your applications backlog, make sure the latest release of IBM's Cross System Product application generator is on your software tools list.

With its new enhancements, Cross System Product can revolutionize the way you develop, test and maintain programs.

For example, just define an application and the system will generate VS COBOL II code for IMS/DC and MVS batch environments.

Cross System Product is a key element of IBM's AD/Cycle™ strategy. So it works hand-in-glove with third-party CASE tools.

What's more, Cross System Product is a building block of SAA™. It lets you generate programs for IBM data bases and SAA operating systems—MVS/ESA™, VM/ESA™, OS/400® and OS/2® EE. This will give your users the same interface no matter which platform they're using.

And because it can work with the IBM PS/2®,

your programmers can have the productivity benefits of OS/2 Presentation Manager™. Such as windowed selection lists, dialog boxes, function icons and select-and-drag mouse controls. Plus, you'll reduce demands on your mainframe.

As if all this weren't enough to spark your interest, Cross System Product comes with some very attractive extras—free AD/Cycle software.

With the initial license at each site, you'll get two free copies of the Cross System Product programmable workstation feature —plus a free copy of the Workstation Interactive Test Tool. With the MVS feature, you also get a free copy of the Software Analysis Test Tool. This special offer will be in effect until December 31, 1990.

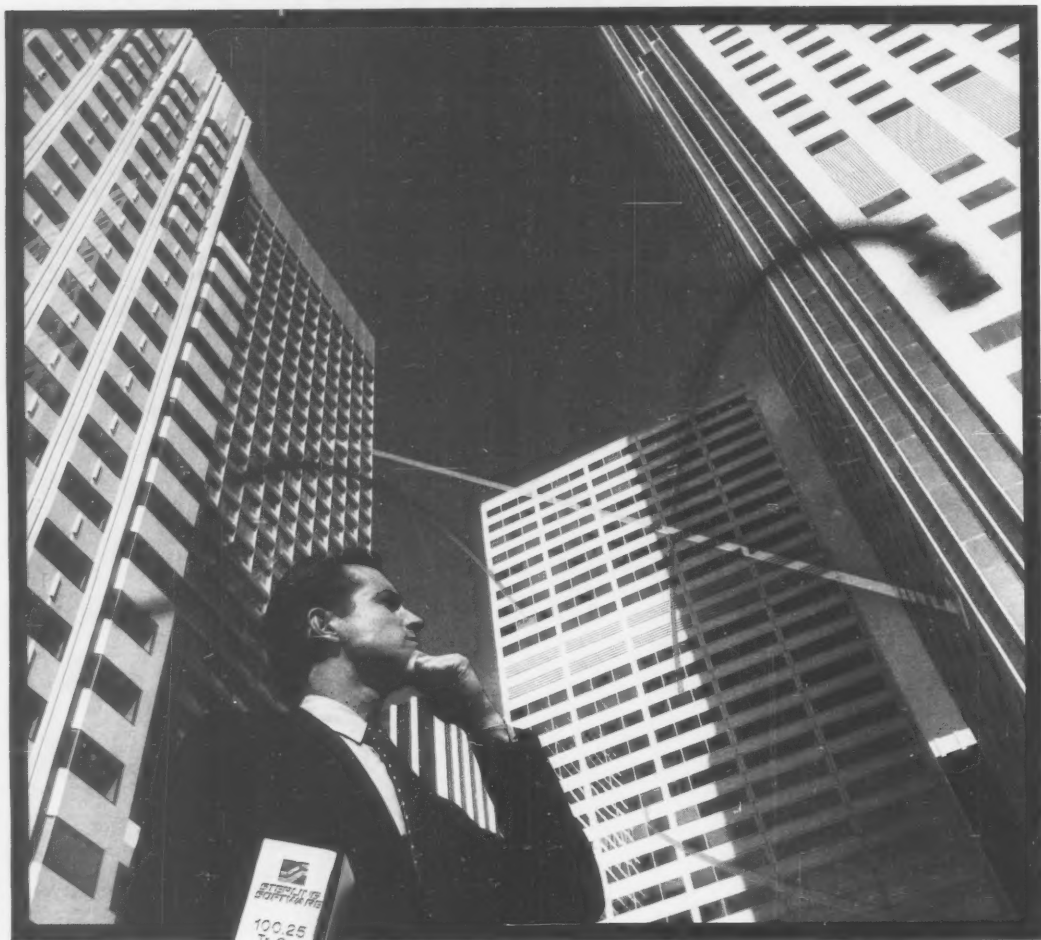
So if you want to start developing better applications quickly, act quickly. Call your IBM marketing representative for a demonstration of the new Cross System Product today.





DATA COMMUNICATIONS

## GROW WITH THE STERLING CONNECTION.



From EDI to electronic funds transfer, your organization's growth is dependent on efficient, reliable data communications. From headquarters to regional offices. Between stores, warehouses and distribution sites. Across a variety of micro, mini and mainframe systems. The Sterling Connection is there. With a family of integrated software products that will streamline your communications network. And give you the edge you need for continued growth.

**SUPERTRACS:** Online BSC/SNA/ASYNC system for simultaneous, unattended data collection and transmission on multiple lines between a host mainframe and remote devices, including minis and micros supporting 2780/3780/3770 emulation.

**TRACS:** The drop in solution for BSC/SNA/ASYNC information transfer.

**PC-TRACS:** A variety of emulation products for data exchange and file transfer between PCs, minis, mainframes and other devices.

If your organization is growing, the Sterling Connection is in your future.



**STERLING  
SOFTWARE**

THE FUTURE IS STERLING.

Sterling Software, Systems Software Marketing Division, 11060 White Rock Road, #100, Rancho Cordova, CA 95670. (916) 635-5535.



# IDC WHITE PAPER

---

*The Pick  
System Environment*

EXECUTIVE SUMMARY

*In this day of hostile takeovers and faceless corporations, it is refreshing to come upon a privately held company still based on the vision of its founder. Indeed, 25 years after he converted his dream to reality, Dick Pick remains the guiding light behind Pick Systems. A lot of promising companies have come and gone in that time, but Pick persists.*

*Not only does the company persist, but it prospers. Building upon its innovation of the early days, the Pick environment has expanded to embrace today's technology. No longer just an operating system, Pick has reached out to the information systems world by developing a relational database management system. This has made it a player in the UNIX and MS-DOS worlds.*

*Ease of access and use distinguish the Pick environment. The way various levels are presented lends itself to a logical understanding by users, allowing them to navigate through these levels without the aid of programmers. This ability to view data without concern for how the database management system software has to handle fields, records, files and strings makes Pick a powerful query and information retrieval model. Advanced Pick enhances ease of access and use by making it even easier for end users to browse through data.*

*Despite its innovative past and aggressive plans for the future, Pick is still competing in a hostile world. The Pick environment has a host of strengths to see it through. Its original design, the single vision of Dick Pick and its application base of over 3,000 products place it in a strong competitive position. However, Pick must contend with threats such as its limited marketing, hostile advances from larger database companies and the possibility, however remote, of an outside acquisition.*

*If the company parries these threats, IDC believes it is poised to thrive in the '90s.*

THE PICK SYSTEM ENVIRONMENT

AN IDC WHITE PAPER FOR INFORMATION SYSTEMS MANAGEMENT

**THE HISTORY OF PICK**

The Six Goals of Pick

**KEY SUCCESSSES IN THE PICK DESIGN**

The Pick Data Model  
The Correlative Concept  
The Data Dictionary  
The Pick File System

**THE PICK FILE SYSTEM**

The System Level  
The Account Level  
The Dictionary Level  
The Data File Level

**THE PICK ENVIRONMENT TODAY**

Movement to Industry-Standard Operating Systems  
Pick and MS-DOS  
Adding DBMS and Applications to the Operating System Mix  
Advanced Pick

**PICK IN THE '90s**

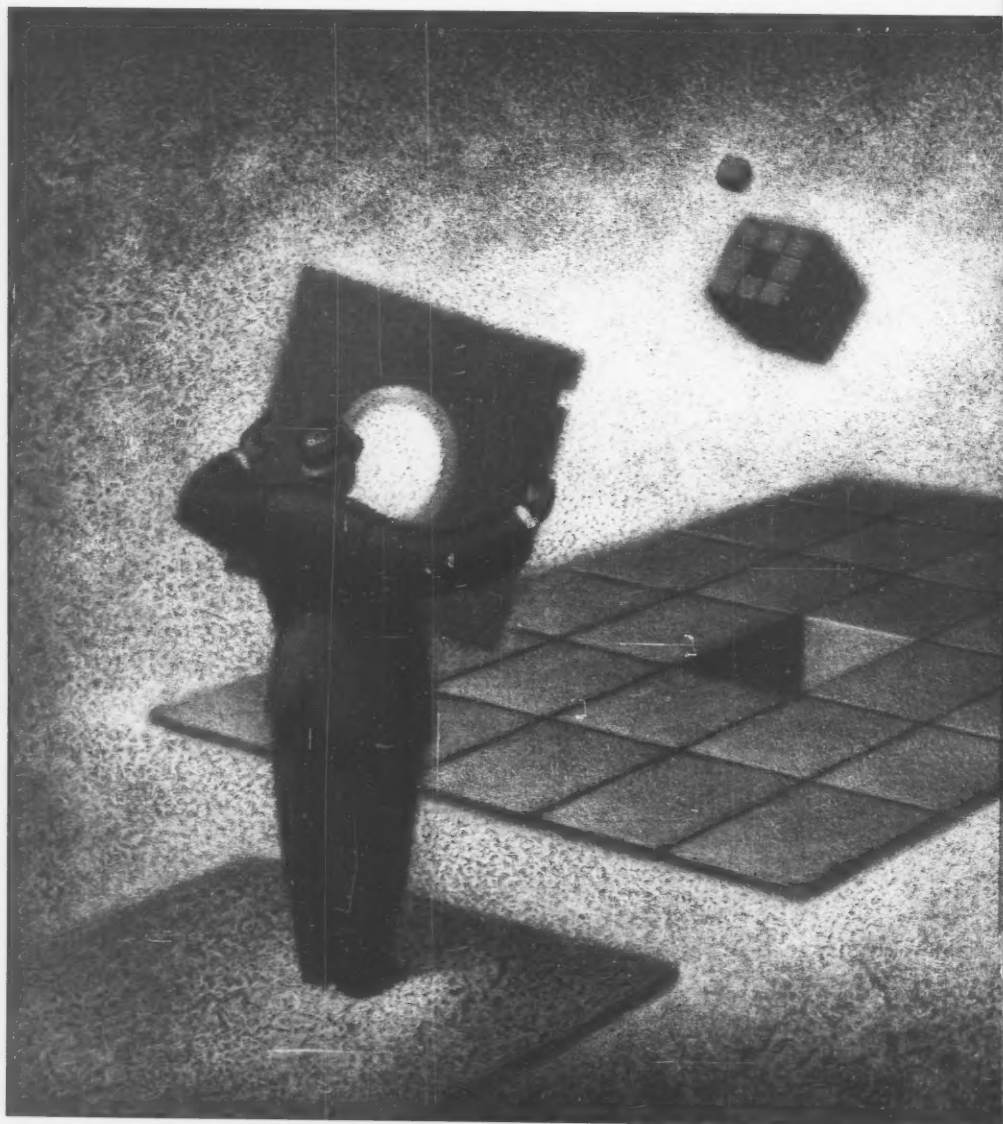
**PICK WEAKNESSES**

**PICK OPPORTUNITIES**

**THREATS TO PICK**

**PICK STRENGTHS**

**SUMMARY**







# PICK

THERE ARE PRODUCTS THAT ARE CONSIDERED CLASSICS  
DUE TO AGELESS DESIGN AND CONTINUING FUNCTION.  
WORDSTAR, 1-2-3 AND THE VAX ARE AMONG THEM.  
WITH SUCH PRODUCTS, THE PASSAGE OF TIME ONLY

SERVES TO REINFORCE  
THE CORRECTNESS OF  
THE EARLY VISION, THE  
UTILITY OF THE INITIAL  
DESIGN. THE PICK  
SYSTEM BELONGS ON  
THIS LOFTY LIST OF IN-  
FORMATION INDUSTRY

CLASSICS. ■ ALTHOUGH IT HAS DEVELOPED INTO AN  
APPLICATIONS-BASED DATABASE MANAGEMENT SYSTEM  
(DBMS), PICK WAS THE FIRST OPEN OPERATING SYSTEM  
FOR GENERAL BUSINESS USAGE. IT TOOK A DIFFERENT  
TACK FROM ITS CONTEMPORARY COMPETITOR, UNIX.  
PICK WAS ORIGINALLY ORIENTED TOWARD BUSINESS  
APPLICATIONS WHEREAS UNIX WAS USED FOR SOFTWARE  
DEVELOPMENT. ■ IN ITS INITIAL IMPLEMENTATIONS,  
THE PICK ENVIRONMENT WAS DEVELOPED ON

minicomputer-level products for small-and medium-sized businesses. It was first implemented on Microdata systems, but moved to a large number of additional platforms in the late '70s.

The key to its design was the multi-user BASIC environment with its reporting capability and query access. These traits allowed the casual business user, who was not a computer professional but needed information, to run his business. This orientation toward the information content in the data files was a unique feature to Pick in its early days.

If you are talking about Pick Systems—the name of the company—you have to talk about Dick Pick himself. Although Dick Pick and Don Nelson were instrumental in the early design of the system, Dick Pick provided the single vision and driving force behind the Pick environment. His single-minded focus enabled Pick to weather many storms and changing trends in the industry.

Pick has endured because concepts thought of as leading edge in the '90s were implemented by Pick in the '70s. Features such as information access, global data dictionaries, end-user programming and application portability are not news to Pick users, who have enjoyed them for 20 years.

This IDC White Paper provides the reader with a clear statement of the genesis, current capabilities and outlook for the Pick environment. Although some that are short-sighted might dismiss Pick from their plans, the utility and function of this open computing environment demand more than cursory examination.

#### THE HISTORY OF PICK

The factors that influenced the development of the Pick system are not in the same mold as those that shaped

#### The Pick timeline

- 1965** Dick Pick and Don Nelson start work on GIRLS for TRW.
- 1969** Pick and Nelson deliver their software to the Army.
- 1972** Pick incorporates Richard Pick & Associates.
- 1973** First commercial introduction of Pick occurs on Microdata 1600.
- 1976** Dick Pick splits with Microdata.
- 1977** Ultimate Corp. becomes second licensee.
- 1981** Pick system implemented on IBM Series/1.
- 1984** Pick system released for IBM PC XT.
- 1985** Pick system released for IBM PC AT.
- 1988** One millionth Pick user, and implementation for IBM RT PC.
- 1989** Pick announces availability of Pick data base for UNIX.
- 1990** Pick ships Advanced Pick on AT&T UNIX, IBM AIX and SCO/UNIX platforms.

Pick's distinction as an industry classic dates back to its 1965 origins.

thousands of other engineering projects. As we shall see, the Pick System is an outgrowth of business requirements, not technology problems.

The precursor to this unique environment was described uniquely by the U.S. Army in 1965, as the "Generalized Information Retrieval Language and System," or GIRLS for short. The name was subsequently changed to "General Information Management." Used as an information retrieval tool, its first business application was tracking parts for the Army's Cheyenne helicopter project. At this point, its name was changed again to Integrated Technical Data System (ITDS).

After the completion of this project, Dick Pick continued to refine the concepts found in ITDS and explore the possibilities for its use in the commercial processing environment. As a result of this 1972 work, in 1973, the environment was ported to the Microdata 1600 processor with limited success, as the 1600 achieved only a 7% market share in the small computer market.

#### The Six Goals of Pick

Given the successes with the Army, and the burgeoning market at the time for minicomputer products, Dick Pick founded Pick and Associates in 1972. The new company's immediate goal was to continue development on the Microdata 800 that was originally started on its predecessor, the Microdata 1600.

The new company had six primary goals:

- Provide a highly productive development environment

#### The six goals of Pick

- 1 Provide fast on-line access.
- 2 Provide user access to information.
- 3 Allow users to easily manipulate the data.
- 4 Simplify the organization of the data.
- 5 Use minimal system resources.
- 6 Provide hardware portability.

Based on the realization of these goals, the Pick environment was a forerunner of systems to follow it by 20 years.

- Provide a highly productive end-user environment
- Reduce keystrokes for non-expert computer users
- Simplify the organization of the data
- Use minimal system resources
- Provide hardware portability.

Although IDC readily admits that advances in processor and system technology have enhanced the ability of vendors in general to deliver performance, it is the fulfillment of these underlying six points that makes for the timelessness of the Pick design and its appeal to users.

Between 1973 and 1977, when the Microdata systems were achieving their limited success in the market, Microdata had what amounted to a monopoly on Pick. However, in 1977 there was a falling out between the

two, which became an opportunity for Pick to support other systems.

During 1978 and 1979, new licensees such as Intertec, Ultimate Corp. and ADDS paid fees reported to be over \$1 million for their ports. However, the distinction of the first port went to the Honeywell Level 6 minicomputer, which achieved this milestone in the form of a product made by its licensee, Ultimate. Porting efforts really heated up in 1981 and 1982 when the IBM Series/1 and 43XX, and models from Pertec, SMI and Altos were all added to the base of Pick-capable systems.

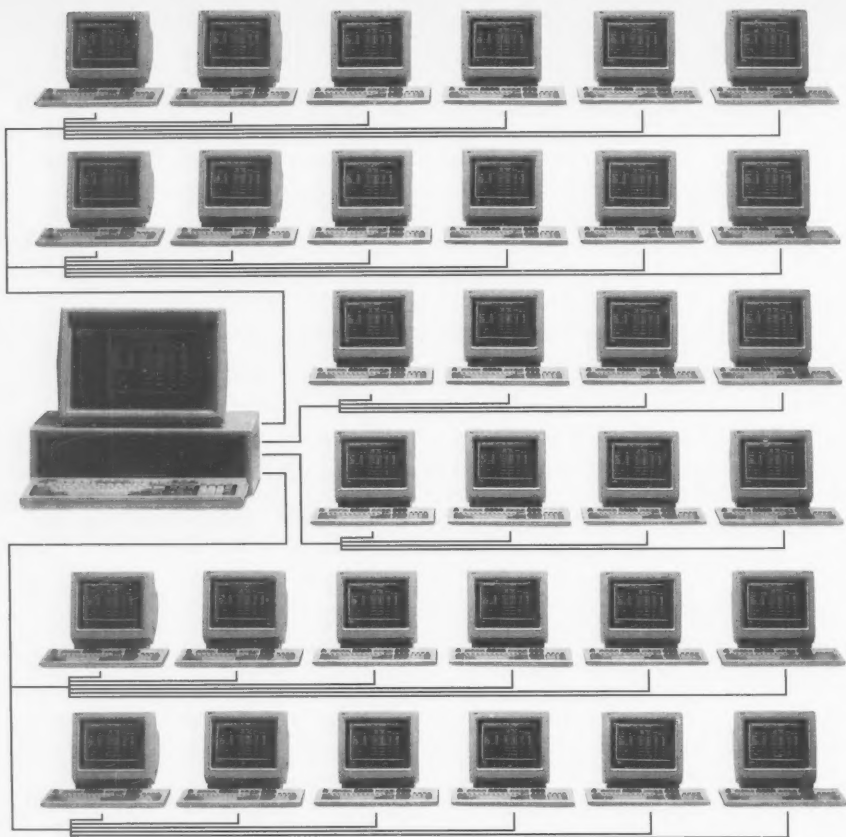
Despite Pick's limited success at the time, clones were springing up. In 1977, a company called Devcom started developing a product that eventually became the Prime

Computer, Inc. "Information" series. In 1982, the Pick-based Revelation system from Cosmos came to market for MS-DOS and the MS-DOS-oriented retail market. Finally, in 1985 VMark Software developed a Pick derivative to run under UNIX. All of these products had some incompatibilities with Pick, but all embodied the same heritage of usability, information access and efficiency.

Currently, sales of hardware using the Pick environment approaches \$2 billion a year and there are three million users, all of whom are taking advantage of one of the most consistently useful environments for users with business problems.

#### KEY SUCCESSSES IN THE PICK DESIGN

Calling Pick a classic in an industry where there are so few implies the company has realized some incredibly



## How To Keep Your PC Working After Thirtysomething.

Try connecting more than 30 busy PC users on a LAN and you'll turn grey before your time. Even your thirtysomething operators will start sprouting a few grey hairs before they're able to get any real work done.

Put them on a Pick System and they'll be up and running in no time at all. As many as 33 users sharing a common database application and accomplishing multiple tasks with the trouble-free ease, power and speed only a true multiuser relational database system can deliver.

You don't even need PC's. A single PC/386 will drive 32 low-cost terminals (or PC's for that matter) just fine. With much faster speed and response time than other comparable multiuser database management systems. And Pick is specifically designed as a multiuser business applications system that is easy to

use, update and modify as your business needs grow.

No matter how many users you need, the Pick System grows with you. The same Pick application can run on most major computer hardware ranging from PC's, to mid-range minicomputers, RISC-based systems and fault-tolerant mainframes.

There's no other relational database system more cost-effective and efficient for developing, maintaining and supporting multiuser applications. Call Pick Systems for the story the LAN people won't tell you until you turn grey before your time.

**PICK<sup>®</sup> PC**  
SYSTEMS

Pick Systems, 1691 Browning, Irvine, CA 92714 (714) 261-7425  
Pick System is a registered trademark of Pick Systems Inc.



prescient design achievements. From IDC's perspective, the four most important of these are:

- The Pick data model
- The correlative database
- The data dictionary concept
- The Pick file system

Each of these building blocks is critical to the timeless viability of the Pick design. They enable Pick users to have capabilities today that the trade press "predicts" will be on the horizon tomorrow. They all underlie Pick's philosophy that the goal of the information system is to readily provide information. It is clear that the Pick environment was designed with that as its highest priority.

#### The Data Model

The Pick data model is one of the most elegant characteristics of the entire design. As is evident from the Pick data model chart, it is designed to avoid the issue of the single purpose "fields and values" that is common in so many other products. Within a Pick file there are items, values and attributes. The beauty of the system lies in the fact that values can be items, and attributes can also be files. This leads to a truly relational environment where the view of the information can be tilted to whatever axis of entry specific users may have.

In addition, the presentation of the information is done in a layered fashion allowing users to see levels of information. As can be seen from the Pick layering effect chart, in this environment, a query can start at one level and then proceed through the data to greater levels of specificity. As the chart shows, the presentation of the information lends itself to a logical understanding by users of the relation-

ships as they navigate through the data. This is done based on their own logic, not a programmer's.

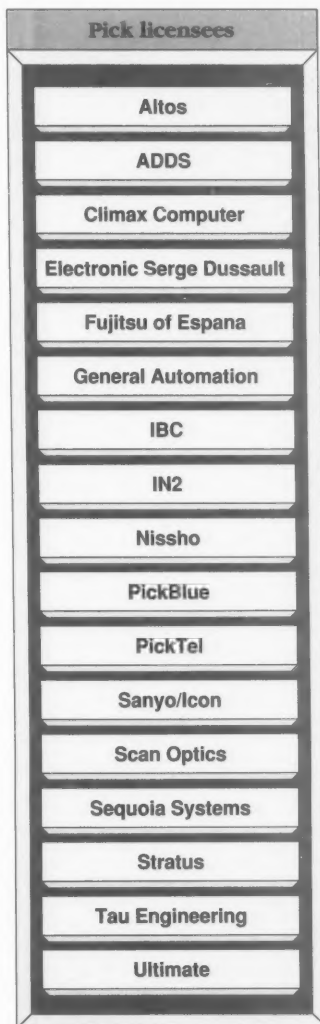
This ability to go up and down through the base of information without worrying about how the DBMS software has to handle fields, records, files and strings constitutes a powerful query and information retrieval model. This is the basis of the "correlative" concept. IDC has found that this concept's flexibility in letting users structure what they perceive to be elemental relationships is very beneficial and productive.

#### The Correlative Database

This second design aspect is best described by a term that is unique to the Pick environment, correlative. It describes a fundamentally different approach to applications and queries from that taken by relational systems, and has significant merit. The correlative is essentially a comprehensive way to report on information in the database without the need for understanding specific relationships and dependencies of data. This is accomplished via the rules and paradigms that are inherent in the master data dictionary of all Pick systems.

An additional difference between the relational and correlative query is the bidirectional capability that is found in the Pick correlatives. In the majority of competing databases the relationships and queries are typically handled in a unidirectional fashion. While it is possible to have two distinct pieces of data, fields or records relate in two directions, this is typically accomplished via a circular logic route, not a single path with two directions.

Pick's ability to do this transparently not only simplifies the process for users, it results in better efficiency. This capa-



What started out as a trickle with the first commercial port to Microdata in 1973 snowballed by the end of the decade. Now, Pick has established a working relationship with both AT&T and IBM through the formation of Pick subsidiaries, PickTel and PickBlue.

bility makes the correlative an extremely powerful vehicle for query and report generation.

As will be evident in the next section, the presence of the master dictionary and its rule set mitigates the "correct-query-syntax/incorrect-results" phenomenon that occurs in other environments.

## The Data Dictionary

One of the vogue concepts among the information system cognoscenti is "global data dictionary". It describes an environment where all information contained within a given system is listed, along with necessary conditions, in a master data dictionary. Many large IBM users pursue the realization of this concept today as if it were the Holy Grail.

Here again is where the initial GIRLS specification, which provided the foundation of the data dictionary, proves its timelessness. In this dictionary, every file and attribute is recorded along with key relative information.

Invoked upon logon, the data dictionary allows Pick reports and queries to be organized simply. The availability and location of information is made comprehensible to users who are no longer required to become experts in data structures.

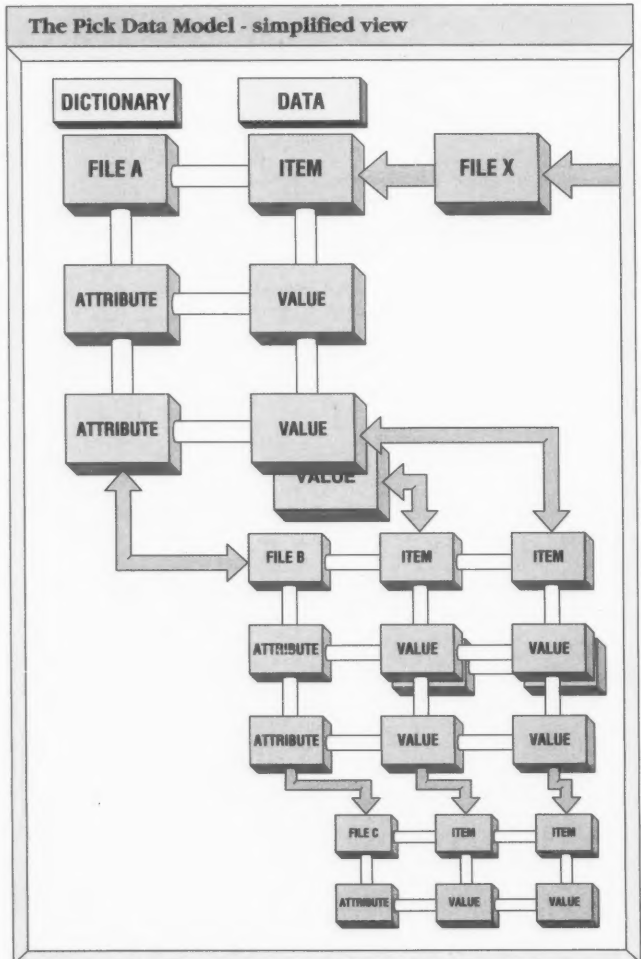
The ability to move beyond the issue of finding information and into using it is essential not only to Pick users. For instance, one of the key tenets of IBM's Systems Application Architecture strategy is the eventual development of a comprehensive data dictionary. It will be a triumph for IBM if it can replicate the ease of use achieved by Pick.

In the design of the Pick file system, the dictionary is the interface between the user and the data files. This relationship manifests itself in the processing speed and organization found in Pick application systems.

## THE PICK FILE SYSTEM

The Pick DBMS is comprised of four key elements: The system level, the

account level, the dictionary level and the data file level. A discussion of each follows.



The beauty of the Pick Data Model lies in its relational characteristics which provide users with a flexible view of data.

### The System Level

The system level handles many of the system's administrative duties. Every time there is an end-user request, it is called to determine if the inquiry is valid in light of the privileges allowed to that account. The system level operates in conjunction with the next level, the account level.

### The Account Level

The account level's main function is to record and provide to the system level the details about each valid user account. The information maintained includes file restrictions, allowed access methods, security information and the number or type of commands that are permitted by that particular user account. The centralization of these tasks and their inherent function within the overall system increase the ease of security and account/user control.

### The Dictionary Level

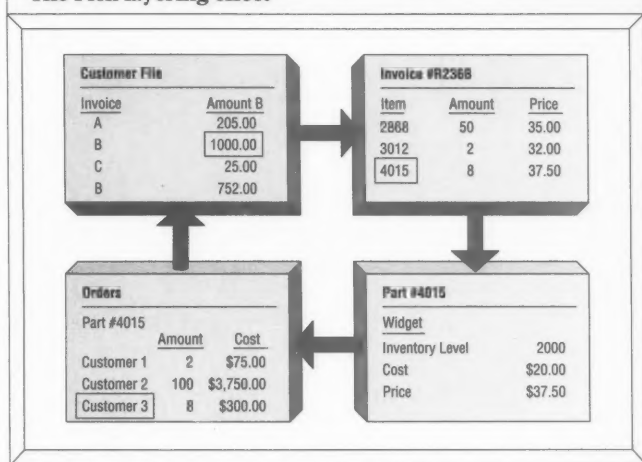
The dictionary level is described thoroughly in the preceding section. It is important to remember that this level is the actual point at which the user interfaces with the system.

### The Data File Level

The data file level in the Pick environment is not notably different from many other DBMS systems in which files comprise the lowest level.

It is significant that within this four-part structure there is a dependent relationship between the four elements. This integration simplifies system use. There is, however, one caveat to consider. Pick does not presently allow for the substitution of third-party products to replace any of the four levels described here. This can be a problem for users who wish to use a PC front end or a different query tool.

### The Pick layering effect



The Pick environment is designed to let users gain access logically and without programmer intervention.

### THE PICK ENVIRONMENT TODAY

As would be expected from any 25-year-old product, there have been a number of changes to the initial Pick implementation. These key changes are:

- The movement to industry-standard operating systems, especially UNIX and MD-DOS
- Pick's movement away from being an operating system vendor to becoming a DBMS and applications supplier
- Advanced Pick and the introduction of system-wide automatic, ad hoc updating.

### Movement to Industry-Standard Operating Systems

For years, the press and analysts chronicled the competition between Pick and UNIX as warfare. In that war, the goal was to conquer the minicomputer market. Pick was armed with its

applications and commercial appeal, while UNIX fired back with its availability and the C language. Now the battles are largely over and the two combatants are realizing a peace dividend in the postwar years. Some Pick licensees will continue to use the entire Pick operating system and database, but it is no longer necessary.

This is because the Pick database and its applications are now portable to UNIX and other industry-standard operating systems. While UNIX integration is the primary thrust today, IDC believes MS-DOS and OS/2 will also be targeted.

Implementing Pick on UNIX is a straightforward procedure. Seamlessly combined, they are two highly complementary products, with each having strengths that counter the other's weaknesses. Most notably, Pick has a strong application base and is easy to use, while UNIX has strong communi-

creation capabilities and development tools.

Pick's application base of over 3,000 products is composed of both vertical-industry and generic offerings, with vertical-industry comprising the vast majority. On the vertical-industry side, there are products such as ACT II, a mail-order house software product from Rigden, Inc., Cacos, a cargo control system from CRS Systems and Distributors INFO FLO, a wholesale distribution package from Interactive, Inc.

Generic products include CompuSheet+, a spreadsheet product from Via Systems, Inc., The Works, a word processing program from Jet Software, Inc. and AccuPlotII, a graphics product from AccuSoft Enterprises.

#### Pick and MS-DOS

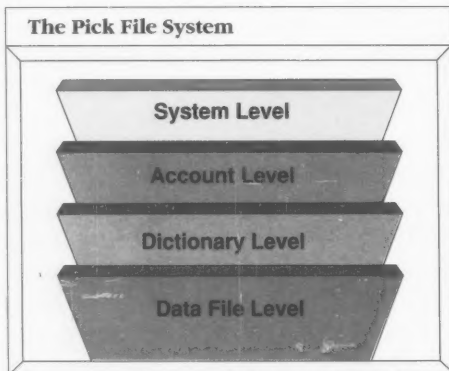
The benefits to MS-DOS can be extensive for smaller companies or workgroups that want more function than they can get from today's rudimentary DOS software, but lack the financial resources to acquire that function.

The Pick DBMS combined with MS-DOS on PCs provides a migration path for many smaller firms or workgroups in larger companies that are at the difficult stage of outgrowing their current PC systems.

#### Adding DBMS and Applications to the Operating Systems Mix

The biggest misconception regarding Pick is that it is only an operating system. Even though this statement was valid in the past, it is no longer true as Pick moves into the '90s.

Just as it is a misconception to think



The Pick file system appears to be hierarchical, but the Pick dictionaries (data which describes data, or meta data) make it global.

of Pick as only an operating system, it is an underestimation to ignore Pick as the foundation for its 3,000-plus database applications that are built, debugged, tested and maintained.

Database technology is not new to Pick. The initial goal of the product design was to build the "Data Management System." However, the technology of the time required that an operating system component also be built in order to deliver a fully functioning system.

Times have changed dramatically. The effects of integrating Pick with industry-standard operating systems like UNIX, MS-DOS and OS/2 eliminate many objections to Pick as a database, and elevate the Pick environment to a more competitive position. Of course UNIX and MS-DOS have also benefited from their newfound Pick compatibility.

IDC believes that many new customers will be attracted to Pick's appealing database and application features. Large companies may spearhead this movement. One of their biggest challenges is providing server-level implementations of data sets for

ad hoc query and reporting functions. While UNIX is clearly becoming more capable in that area, its coupling with a truly end-user-oriented tool such as the Pick DBMS will solve many application problems that would otherwise go unresolved.

#### Advanced Pick

The ongoing development of Pick has led to a number of enhanced versions. Despite this evolution, however, the environment's first monumental change is embodied in Advanced Pick. This change can be divided into three areas:

- Improvements in the actual system
- Improvements for programmers and developers
- Improvements for end users.

The improvements in Advanced Pick at the system level include transaction logging, secondary indexing and B-Tree capabilities. The goal in these changes is to add features for some of the more demanding environments, as well as to improve Pick performance in on-line transaction processing applications.

Improvements for programmers come primarily in the form of tools to improve the efficiency of the development effort and to reduce program code size. The most important of these, in IDC's opinion, is the ability to update data across the critical master dictionary without programming. Another important advance is the inclusion of an input/output processor to eliminate the need to write long system function calls.

For end users, the benefits are most easily seen in the browsing of data.



Advanced Pick allows users to step or browse through data via whatever route strikes their fancy. In addition, font and proportional spacing support have been added, allowing Pick systems to incorporate some of the desktop processing features desirable to end users.

### PICK IN THE '90S

Calling Pick an industry classic is eminently justifiable. But how long can it maintain this lofty status in an industry that thrives on change? IDC believes there will be an increasingly important role for Pick. Some database technologists may disagree, but the need for information access and usability by the more than 50 million regular computer users in the U.S. is a strong force.

In order to fairly consider how Pick Systems and the Pick environment might look five or six years from now, IDC believes that a "Weaknesses, Opportunities, Threats and Strengths Analysis" is in order.

### PICK WEAKNESSES

The weaknesses of the Pick environment fall into two disparate categories: the inherent weaknesses of the system and the lack of publicity leading to misconceptions about the company. They are by no means fatal; in fact, the Pick environment could continue successfully and even grow in its present state. Nonetheless, there are these problems to consider:

#### Lack of Fortune 1000 Impact

The Pick environment has been a success in the small-business segment of the market that, unfortunately, draws little attention. Despite the size, growth and utility of small-business solutions, they are generally ignored by many high-powered movers and

shakers. Pick has to improve its image and impact in larger sites. One way to do this is by aligning itself with UNIX.

### Lack of Communication Capabilities

The issue that was not foreseen in the initial design of Pick was communication. Pick is inherently a standalone system. The addition of UNIX partially mitigates this problem, but how Pick will integrate into a truly distributed DBMS environment is still a looming question. Again, its newfound affiliation with UNIX may help.

### Limited Programming Tools

Despite the large amount of function provided in the Pick development environment today, there is still room for more. With the rest of the world moving

toward C, Pick must add to its own Basic programming language offering. Also, there may be some issues at the graphic user interface (GUI) level. Pick does presently support GUI, but the inclusion of Native X or Windows/PM calls might be required in the future. The addition of Advanced Program-to-Program Capabilities would help.

### Poor Performance in Floating Point

While it is certainly no secret that the Pick environment was designed to deal with textual or string-related business data processing, the pressure for expanded quantitative, computational facilities is being felt. IDC's user surveys have found that the performance issue is not going away. The pressure may get turned up even more by the

UNIX/Pick strengths and weaknesses		
Pick	Strengths	Weaknesses
	Application base Ease of use Stability Single vision Data dictionary	Communications Programming tools Trained developers: numbers Floating Point Fortune 1000 penetration
UNIX	Strengths	Weaknesses
	Development tools Communications Technical/Floating Point GUIs Horizontal applications	Ease of use Application base Version warfare Multiple visions Vertical business applications

Once rivals, UNIX and Pick now complement each other, a development that bodes well for Pick's commercial fortunes.

inclusion of more complex budget and numerical calculations as new business applications strain the present Pick system.

## **PICK OPPORTUNITIES**

The movement to UNIX and the break with some of the historical emphasis on Pick being only an operating system have positioned Pick in a strong marketing position. While the firm is not cultivating "unplowed fields" untrod by the competition, IDC believes there are still substantial opportunities. They include:

### **Small Business Upgrades**

Although the small business segment of the market has its drawbacks, it also has its advantages. The trade press and analysts may think there is no market outside the Fortune 1000, but IDC has found that the small business market is comparable in size to its Fortune 1000 counterpart. IDC estimates that as many as 750,000 of these small estab-

lishments are outgrowing their standalone PC systems. Pick is very well positioned to make major sales gains in this segment.

### **The UNIX Business Database**

Although there are a number of UNIX database products that are selling very well, all of them tend to be high-end products with limited application catalogs. The Pick system is a very different product from those of Oracle, Ingres, or Informix. For those customers who are more business-than technology-oriented, Pick is likely to have a strong appeal.

### **PickBlue and PickTel**

These two Pick subsidiaries are charged, respectively, with optimizing Pick's presence with IBM and AT&T. These alliances are structured in a manner to more effectively generate business than engineering exchanges. The IBM RS 6000 implementation, in particular, appears to give Pick a broad market, with little in the way of established competition.

### **Increasing Customer Attention to Information Access**

The Pick environment clearly provides access to information contained in the database with minimal programming and maximum organization. Microsoft's big thrust, its "Information at your fingertips" concept, is similar. As actual applications that require user access to information grow, Pick has a large opportunity to play an important role.

### **THREATS TO PICK**

As with any other player in the information industry, Pick is subject to menace from within and without. The threats it should be most immediately concerned with include:

## **Pick opportunities**

1 Small business

2 UNIX "business" DBMS

3 PickBlue and PickTel

4 Need for information access

Pick is betting its future on links to small businesses, UNIX, IBM, AT&T, and the need for user-friendly information access.

### **Limited Marketing**

In an industry where making the loudest possible noise has become a key selling requirement, Pick clearly is not shouting. It does not help that the word "Pick" does not show up in many of the licensees' marketing materials. The decision by more aggressive companies to bury Pick under a ton of marketing fodder is clearly a concern. Pick must respond by aggressively promoting its existence and its quality. This means spending money.

### **Slow UNIX Acceptance**

Pick's increasing reliance on the UNIX connection closely ties its fortunes to those of UNIX. If UNIX stumbles in its march toward universal acceptance, Pick will also feel the pain. IDC expects that Pick license sales will continue to grow based on Pick as a standalone entity, but the largest long-term growth will come if UNIX succeeds. What can Pick do to help ensure that success? Unfortunately, very little. However, it has

## **Pick weaknesses**

1 Lack of Fortune 1000 penetration

2 Communications

3 Limited tools

4 Poor number crunching

While Pick's lack of visibility among Fortune 1000 companies is countered by a strong presence among smaller firms, its lack of communication capabilities makes it reliant on systems such as UNIX and MS-DOS.

joined UNIX International and that can only help.

#### Acquisition of Pick

With revenues of around \$25 million annually, the privately-held Pick is not attractive to would-be suitors based on its financial prospects. However, if the company were bought – and it is definitely not for sale – the delicate formula that has guided it since its inception could be irretrievably altered for the worse. Of course, a well-managed acquisition could also be a great benefit.

#### The Large Database Suppliers

Clearly companies such as Oracle, Microsoft, Sybase, Ashton-Tate and even IBM have not yet considered Pick a threat to their sales or market share. If there were a change of mind and some of these powerful DBMS vendors attacked Pick in the marketplace, Pick could have serious problems—problems it has never before faced. It would be in a stronger position to

ward off the behemoths if it increases its revenues.

#### PICK STRENGTHS

There are many things that are right with Pick, or the environment would not have grown and prospered for so long. These strengths are the key to continued future growth:

##### The Pick Design

The fundamental design, specified 25 years ago, is as appropriate today as it was in 1965. The concepts of information access and data dictionaries are the building blocks that other systems are just now trying to add.

##### Single Vision

Time after time, IDC has seen that the most effective, efficient and timely designs are controlled and managed by either a single individual or a very small group. In the Pick case, it is accurate to say Advanced Pick represents 25 years of vision by Dick Pick. Because of his stewardship, the company maintains a clear goal and a definite direction. All these pieces add up to a competitive advantage.

##### System Efficiency

Somehow, the incredible efficiency of the Pick environment seems to be ignored. With OS/2 requiring 4M bytes of memory per user, Windows needing 2M bytes and Apple's Multifinder also consuming 2M bytes, it is amazing to see this elegant multi-user system supporting 65 on-line users with only 16M bytes. For smaller environments, Pick can run up to 10 users on a 640K byte, 286-based machine.

While little is made of the fact that Pick will run under configurations not seen since the late '70s, IDC believes customers who prefer to buy less hardware will be attracted to the Pick solution.

#### Pick strengths

1. Pick Design
2. Single Vision
3. Efficiency
4. Application Base

Pick relies on its prescient design to survive in today's competitive information industry environment.

#### Application Base

Even though many of the Pick applications are vertically oriented for smaller firms, there are others that are universally useful. It is important to realize most of these applications have been around long enough to be fully tested and debugged. IDC believes this is the kind of mature technology that users feel most comfortable with.

#### SUMMARY

In summary, the Pick environment is one of a handful of products that can be considered a classic in its design. Due to its many strengths, it is better positioned today than ever before. It is especially well positioned to take advantage of UNIX and other non-proprietary systems.

The fact that Pick is end-user oriented, and is designed to solve information needs outside the realm of programmers is its strongest edge. As the industry has become computer-rich and information-poor, the need for the Pick environment has grown exponentially.

#### Pick threats

- ▶ Limited marketing
- ▶ Slow UNIX acceptance
- ▶ Potential acquisition
- ▶ Other DBMS vendors

Pick may suffer if it does not overcome its traditional disdain for self promotion. An acquisition could also change the company for the worse, as could increased competition from the large DBMS vendors.

# A NEW MEANING TO THE TERM "DOUBLE STANDARD"

PICK and UNIX. The multi-user business management solution from Pick Systems.

This union of two industry standards, the PICK System and UNIX® System V, IBM's AIX or SCO UNIX 386, provides PICK users with all the connectivity and interoperability advantages of the UNIX system while providing UNIX users with access to over three thousand PICK multi-user business application solutions.

All without compromise.

So if your business depends on supplying your customers with a better business solution, perhaps you should look into doubling your standards and call Pick Systems at (800) 367-7425 for more information.

**PICK**  
SYSTEMS

1691 Browning, Irvine, CA 92714 (714) 261-7425

PICK System and PICK are registered trademarks of Pick Systems.

UNIX is a registered trademark of AT&T in the US and other countries.

AIX is a registered trademark of IBM. SCO UNIX 386 is a registered trademark of Santa Cruz Operation, Inc.



# PCs & WORKSTATIONS

## COMMENTARY

Christopher  
Lindquist

### Time to turn up the heat



It's becoming harder to trust the personal computer software industry. What once seemed to be a

vibrant market full of quality-conscious competitors viciously trying to outdo one another has become a rundown and listless arena based more on marketing than products. Software often arrives well after scheduled release dates, without promised functionality; what functionality is provided is often so buggy as to make a "use at your own risk" sign seem appropriate.

Ashton-Tate's Dbase IV Version 1.0 was one of the most notable examples of this trend. The product, since succeeded by Version 1.1, was so unstable that some consultants refused to take contracts requiring its use. Ashton-Tate is far from alone. Microsoft's latest version of Windows has many users enthralled — but also has bulletin boards crawling with reports of disk-threatening problems.

Nantucket Software's Clipper 5.0 is a great product by most accounts — if you manage to install it and get past the typos in the "Getting Started" guide.

*Continued on page 73*

## Apple looks at second-sourcing

*As market share, earnings slip, Apple considers a once-unlikely option*

BY JAMES DALY  
CW STAFF

CUPERTINO, Calif. — If an Apple Computer, Inc. employee had poked his hand in the air at a staff meeting two years ago and suggested that the company look beyond its own four walls for a partner to manufacture important system components, the situation could have turned ugly. Today, that person might be considered a visionary.

With market share and earnings slipping, Apple's top executives are considering a broad second-sourcing project that could put the spark back in the firm's bottom line and offer customers something they haven't seen in years — steady enhancements to the Macintosh personal computer line at rapid intervals.

Apple will reportedly work with Japanese giants Sony Corp. and Toshiba America, Inc. to develop and manufacture its next-generation Macintosh laptop, a move that would link Apple with experienced players in a hot market in which it has thus far only managed to stub its toe.

While the concept of second-sourcing has long played an integral role at firms such as IBM and Compaq Computer Corp., one of Apple's cornerstone tenets has always been that its machines be wholly manufactured within its own facilities.

"Apple always believed that designing the right product was more important than time to market," said Peter Rogers, an analyst at Robertson, Stephens

& Co., an investment house in San Francisco.

The result of this mind-set was a sluggish product introduction pace that frustrated users. "For a company that has a reputation for being an innovator, they often seem to miss their chance to be the first one out of the gate with a new product," said Bill McCloud, document publications systems manager at the Jet Propulsion Laboratory.

After the 1984 arrival of the Macintosh, for instance, Apple brought forth only four additional models from 1985 through 1988. Compaq, meanwhile, introduced four new models in 1987 and four more in 1988, a pace that analysts said resulted in exceptional sales and profits for the Houston-based firm.

### Laptops an option

Observers said the rapidly expanding laptop market makes a logical first choice for a major second-sourcing venture. "Over the next few years, portability will become as commercially significant in computers as it now is in typewriters, televisions and stereo equipment," said Richard Shaffer, editor of "Technologic Computer Letter," an industry newsletter in New York. The laptop arena is expected to grow 16% to \$2.75 billion this year, according to International Data Corp. in Framingham, Mass.

So far, Apple has failed to take advantage of the uptick. The expensive Macintosh Portable has failed to catch on, despite a 15% price cut in April. Apple insiders

have confessed disappointment with the machine.

The move could be extended to notebook portables in a market that is also growing tremendously. Although Apple Chief Executive Officer John Sculley would not discuss the possibility of a second-sourcing deal, he has acknowledged that there are no "sacred cows" at Apple and that the miniaturization processes needed to craft a notebook computer are beyond Apple's present capability.

Ed Birss, senior vice-president of engineering operations, also indicated that there is a

strong possibility Apple will have an outside producer manufacture its next-generation laptop.

If the firm's second-sourcing plans reach fruition, it will represent another step in a series of moves to get Apple computers out the door quickly. During the past two years, Apple executives have reorganized operating units, reconfigured manufacturing facilities and streamlined the design process.

Analysts said such moves are necessary for Apple, which has seen its share of the PC market fall from nearly 15% to about 10%, according to Dataquest. "Second-sourcing may be a new concept at Apple, but Apple is going to have to assimilate a lot of new concepts if they want to remain competitive," Rogers said.

## Manzi defends Lotus' fight to protect 1-2-3 copyright

BY PATRICIA KEEFE  
CW STAFF

NEW YORK — Breaking a long silence on the topic, Lotus Development Corp. President and Chief Executive Officer Jim Manzi took a stab last week at clearing up what he called the controversy and misunderstanding surrounding Lotus' aggressive protection of its spreadsheet technology.

A U.S. district judge in Boston ruled recently that Paperback Software Inter-

national had infringed on Lotus' 1-2-3 copyrights [CW, Oct. 22].

"Paperback didn't just appropriate a command here, a command there. They pretty much ate the whole thing," Manzi said, referring to 1-2-3's menu.

Lotus has separate but similar suits pending against Mosaic Software, Inc., Borland International and The Santa Cruz Operation.

Despite appearances to the contrary, the software industry is not about to be taken over by lawyers,



John Owens  
Lotus CEO Manzi

*To page 76*

## Micro Focus Advanced ANIMATOR

The best COBOL Debugger  
on any platform

See your source code in new ways and  
re-engineer your COBOL programs with  
Micro Focus Advanced ANIMATOR™.

**MICRO FOCUS**  
A Better Way of Programming™

- ◆ Advanced ANIMATOR is a component of the Micro Focus COBOL/2 Workbench™ used by thousands of professionals to create industrial strength business applications for mainframes and PCs.
- ◆ Choose ANIMATOR's "what you see is what you wrote" approach to testing and debugging. Watch your program execute and see every element and its value displayed automatically. Or, step through your program in a line-by-line approach.



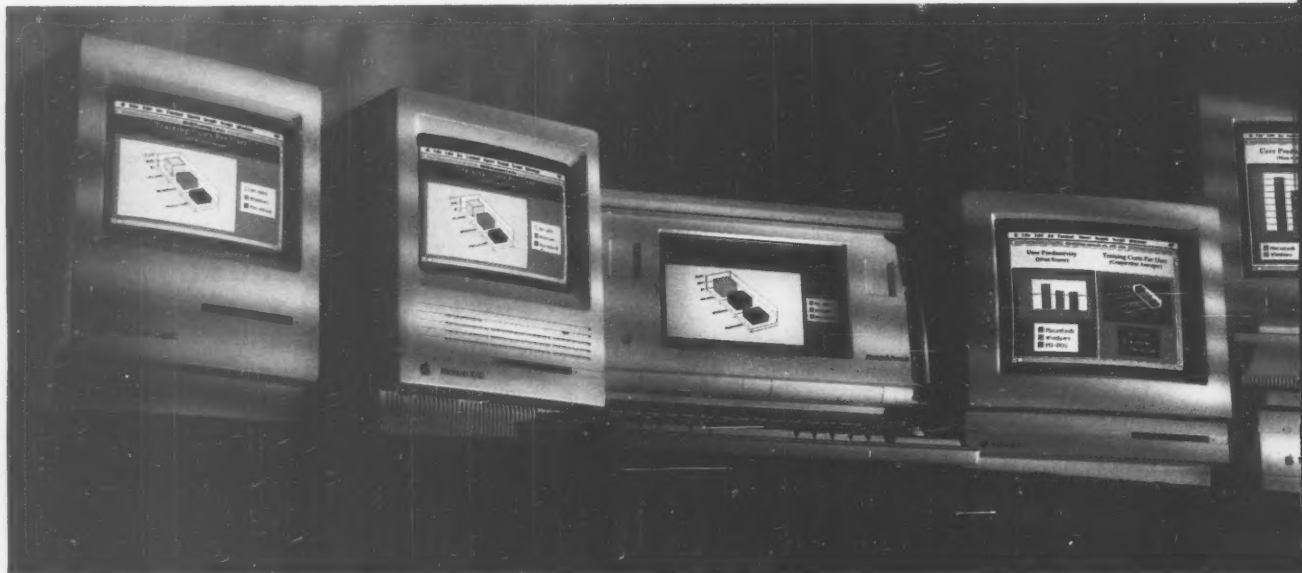
- ◆ Query any data item and change its value. Set positionally specific conditional break-points as well as non-positional conditional break-points. Reset execution to any point in the program. Key in and

execute any valid COBOL statement dynamically with ANIMATOR's DO facility. You are in total control of your test environment.

- ◆ The Structure ANIMATOR module dynamically creates structure charts of any COBOL program. And, it highlights each module as it executes. See paragraphs, sections, and other logical structures in a block diagram format. View them in split screen mode with the line-by-line ANIMATOR display in the other window.
- ◆ Analyzer™ measures and displays the number of times each line of code executes. Unexecuted code is highlighted. ANIMATOR also has a visual backtracking facility for interactive retracing along the execution path.
- ◆ COBOL Source Information™ (CSI) is another feature within ANIMATOR. Utilizing CSI, you can locate any data items and/or procedures that were not explicitly referenced. Get a dead-data analysis and statistics showing the number of times each paragraph name is invoked, where it is invoked from, and what procedure it invokes. CSI will also show you a CALLED sub-program tree structure and a copy file structure.

For more information on Advanced ANIMATOR  
and the other Micro Focus COBOL tools,  
call us today at 1-800-872-6265 or 415-856-4161.

# Now that even afford a Macintosh, which



*This is all of them. From left to right: The new Macintosh Classic, the well-established Macintosh SE/30, the Macintosh Portable, the new Macintosh LC, the new Macintosh IIx, plus the Macintosh*

In 1984, Apple introduced the first Macintosh® on the simple premise that people shouldn't have to learn to work with computers. Computers should learn to work with people.

Today, Macintosh is still the only computer system designed from the chip up on this principle.

Meanwhile, other computer companies are scrambling to make their conventional technologies emulate what is still unique about Macintosh. But no other personal computer comes close to matching the record of stability, consistency, and innovation enjoyed by the Apple Macintosh.

**At \$999\*, the computer people actually use  
can be used by a lot more people.**

We're now introducing three new Macintosh personal comput-

ers. At prices that make powerful computer technology not only accessible, but affordable as well.

Together, they put much of the power of our most advanced computers into our least expensive ones.

## **The Macintosh Classic.®**

It has everything that makes a Macintosh a Macintosh.

Built-in networking. A SuperDrive™ disk drive, which reads both Macintosh and MS-DOS files.

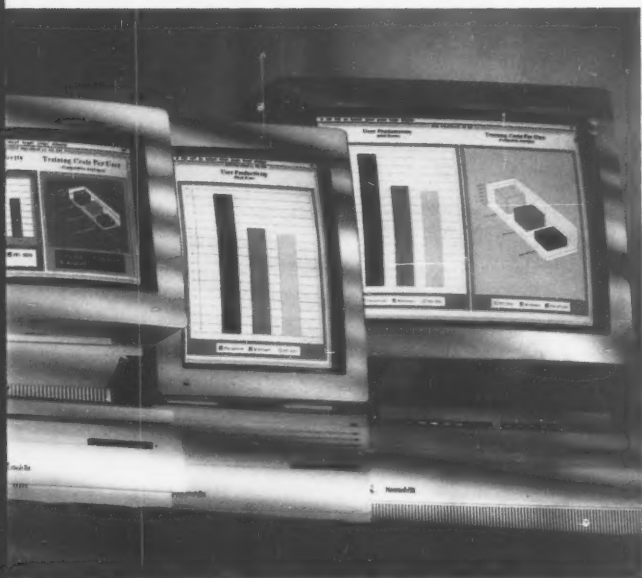
And a \$999\* price that includes the built-in monitor, 1MB of RAM, keyboard, mouse, and system software.

The 40MB hard disk is optional.

Its processor is an 8 MHz 68000 chip. And it outperforms even its popular predecessor, the Mac® SE.

The charts shown use figures included in a 1990 study conducted by Diagnostic Research, Inc., among Fortune 1000 MIS managers familiar with Macintosh and MS-DOS or Windows systems. Call and we'll send you logs. Mac, Macintosh, and "The power to be your best" are registered trademarks, and SuperDrive is a trademark of Apple Computer, Inc. MS-DOS and Windows are registered trademarks of Microsoft.

# Everybody can have one should you afford?



*IIci, and the Macintosh IIcx. Have we left anybody out?*

## The Macintosh LC.

The new, low-cost Macintosh LC introduces the exquisite quality of Macintosh color and graphics to a new, wider world.

With its 16 MHz 68020 processor, it runs all the thousands of Macintosh programs at impressive speed. And, with an optional Apple<sup>®</sup> IIe Card, it runs thousands more Apple II applications as well. The Macintosh LC expands by adding a card to its standard slot. A 40MB internal hard drive is standard.

A built-in video chip runs either an Apple monochrome or low-cost color monitor — without adding a video card.

And the Macintosh LC, like the Mac IIxi, even lets you record your voice and other sounds into the computer.

Which will soon make voice-annotated E-Mail, spreadsheets, and tutorials a standard Macintosh feature.

## The Macintosh IIxi.

The Macintosh IIxi is a powerful building block for business. With a 20 MHz 68030 microprocessor, it delivers serious number-crunching at the most attractive possible price.

Into its sleek package are compressed all the powerful essentials of the Mac II line.

Including an optional 32-bit NuBus<sup>™</sup> slot supporting high-performance graphics and accelerator cards.

Along with advanced networking systems like Ethernet and Token-Ring. Plus a 40 or 80MB hard drive. Built-in video chips drive four different Apple monitors.

## This is a family show.

In 1984, we offered only one Macintosh. As of today, you can choose from seven different models.

And although they include some of the most powerful personal computers ever made, every Macintosh runs with the same point-and-click simplicity.

The way a computer system should work, of course.

But Macintosh is still the only computer system in the world that actually works this way.

## It doesn't cost anything to ask.

With one call, we'll get you to someone who will show you our most affordable new computers. Just dial 800-538-9696, ext. 350.

Now that everybody can afford a Macintosh, come in and find out why you're going to want one.

The power to be your best. 

a summary Fortune 1000 refers to Fortune 500 and Fortune Service 500, which are trademarks of The Time Inc. Magazine Company. \* Manufacturer's suggested retail price. © 1990 Apple Computer, Inc. Apple, the Apple Corporation, NuBus is a trademark of Texas Instruments, Inc. Ethernet is a registered trademark of Xerox Corporation. Classic is a registered trademark used under license by Apple Computer, Inc.





*With software problems delaying shipment of orders,  
management wrestles with excess inventory.*

This manufacturer's order processing software was developed with outdated methods. If you want modern tools for developing quality software, call KnowledgeWare. Our Computer Aided Software Engineering (CASE) tools are helping thousands of users develop better software in less time. In a *Computerworld* survey, CASE users rated our tools best by a wide margin. And our close relationship with IBM makes us the natural choice of IBM users.

For more information on KnowledgeWare CASE tools, call 1-800-338-4130. KnowledgeWare, Inc., 3340 Peachtree Road N.E., Atlanta, GA 30326.



**KnowledgeWare®**

*The World's Most Comprehensive CASE Tool Set™*





## PRODUCT REVIEWS

### Word of perfect E-mail competition

*Wordperfect Office Version 3.0 is more than an appointment scheduler*

With the release of Version 3.0, Wordperfect Corp.'s Wordperfect Office has gone from being an appointment scheduling novelty to a distributed mail and scheduling tool that challenges stand-alone electronic mail packages as directly as it challenges work group packages.

Although it still lacks the capability of setting recurring meetings for a whole work group, previous limitations such as connectivity and improved E-mail functionality have been addressed successfully.

Wordperfect Office runs from a 49K-byte resident module called Shell, which functions as a memory manager; the product also supports virtual memory. Because any module in Wordperfect Office can remain in memory while other modules and applications are accessed, the product offers accessibility and ease of information exchange.

sources as well as people. Notification to specified users includes an alarm and message that will

Wordperfect Office's E-mail capabilities are competitive with stand-alone E-mail packages.



**Wordperfect Office Version 3.0 adds E-mail to scheduling**

Messages can be sent encrypted or password protected, and carbon copies are supported. Blind copying to other users is provided, and messages can be given priorities. Both personal and shared user lists can be maintained for messaging, and message notification shows up over other applications.

The E-mail capabilities include such significant extras as status monitoring and retraction of group messages. In addition, Wordperfect Office can be set up to spell check both incoming and archived mail messages.

Wordperfect Office's documentation consists of a short system administrator's guide that explains the user ID management system and a well-indexed, three-ring user guide that includes illustrations and a tutorial. There are well-organized quick-reference pamphlets and a complete on-line Help system.

There is a toll-free support line, a Compuserve bulletin board and a newsletter. Support is available from 7 a.m. to 6 p.m.

#### Wordperfect Office Version 3.0

Price: \$495 or \$1,495

- Performance: Very good
- Documentation: Excellent
- Ease of administration: Satisfactory
- Ease of use: Very good
- Error handling: Very good
- Support: Very good to excellent
- Value: Very good

Mountain Standard Time, and extended and corporate support is available from knowledgeable technicians.

The five-user version of Wordperfect Office costs \$495 and the 20-user version costs \$1,495. Wordperfect Office Version 3.0 is a fully developed work group package with an interface and features set that can actually integrate co-workers. Its mail system alone is very useful.

Wordperfect Corp., 1555 N. Technology Way, Orem, Utah 84057. (801) 225-5000.

#### Oodles of options

A GOTO DOS option can be used to integrate schedule-related information with other applications on the fly. There is also a clipboard that can be used to integrate schedules and to-do list information with files from other applications and Wordperfect Office's own mail system. Wordperfect Office Version 3.0 retains the function key-based Wordperfect interface.

A series of utilities is included with the product, such as a file manager, a macro editor for Wordperfect products, a program editor and a multimodule calculator. Wordperfect Office also includes a notebook that functions as a shared database.

Unlike more bare-bones schedulers, Wordperfect Office's scheduler manages re-

Views are compiled from information supplied by *InfoWorld*.

pop up over other applications.

Wordperfect Office now supports wide-area networks through asynchronous communications, gateways or network connections. The most significant of the new gateways is a Message Handling System gateway from Action Technologies for Novell, Inc. networks.

Wordperfect Office users can communicate with other E-mail systems such as IBM's Professional Office System and Distributed Office Support System, MCI, facsimiles, VAX/VMS, Compuserve and Telex. The product also has Retix X.400, MCI and Easylink gateways and supports public electronic mail standards such as MCI and Western Union.

A Fax gateway is on the way and PC Wordperfect Office will soon be able to communicate across platforms with Apple Computer, Inc. Macintosh Wordperfect Office users.

### Micrografx maintains market charisma

With the recent release of Charisma, Micrografx, Inc. keeps pace with the extremely competitive charting and presentation graphics market.

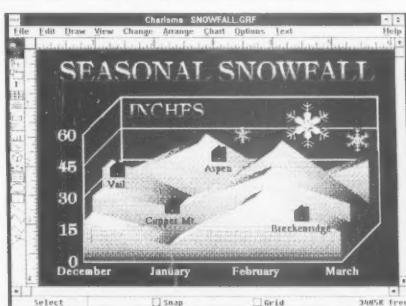
Charisma's main screen features ruler lines that frame the drawing area and toolbox icons that run down the left side. The drawing area can be expanded into multiple pages with an image on each page.

A master page groups all of the images together into small thumbnail views. From this drawing screen, users can cue up templates for making a text chart, pop up a

worksheet for making a numerical chart or directly import a piece of clip art from a library of more than 2,200 images.

Like its predecessor, Graph Plus, Charisma provides a wide selection of numeric charts, but

its most significant improvement is in its text chart capabilities. Now a Text Chart toolbox icon is available with eight default templates and additional custom templates for specific output devices.



**Charisma lets users season charts with graphics**

These templates contain default bullets, headings, fonts and colors. Once picked, the template fills the drawing page.

Charisma's text editor is used to add the text. Other toolbox icons let users import clip art or create a numeric chart. Charisma supports the Microsoft Corp. Windows 3.0

To page 73

## DB2 ON YOUR PC

Develop full scale DB2 applications on your PC! Join the thousands of DB2 developers already benefiting from the productivity gains provided by the XDB-Workbench for DB2.

XDB puts a 100% DB2 compatible SQL DBMS and COBOL precompiler in your PC—seamlessly integrated with Micro Focus COBOL 2 Workbench and its CICS option for interactive development.

Multi-user development can be supported by the XDB-SQL Database Server in MS-DOS, UNIX, OS 2, and Netware-386 environments.

The only tool available that adheres closely enough to IBM's DB2 to allow applications developed on the PC to be migrated to the mainframe with little or no modification.

PC Week  
June 12, 1989

"Develop on PCs... then run the finished software without changes against DB2 data on mainframes thanks to XDB's DB2-compatible database server software."

DBMS  
January 1990

Interested in DB2 power on a PC?

Call (301) 779-6030

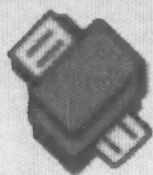
XDB Systems, Inc.

7309 Baltimore Avenue  
College Park, MD 20740  
FAX (301) 779-2429

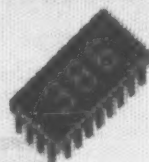


© 1990 XDB Systems, Inc. XDB is a registered trademark of XDB Systems, Inc. DB2 is a trademark of IBM. Other product names are trademarks of their respective holders.

Windo



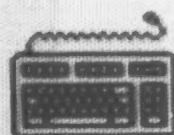
Printers



386 Enhanced



International



Keyboards

# Now, all it takes is and you're

It's only fair to warn you that exposure to new Microsoft® Windows™ version 3.0 has been linked to obsessive and habitual usage. Why?

Because with a simple click of the mouse users can connect to the network, even access and manage network resources. All without cumbersome keyboard commands.

Which means users are now able to share data. Not frustration.

While in the interest of time, the Windows 3.0 graphical user interface

was designed to be easy to learn. And use. Neophytes, not to mention troglodytes, will be up and running in no time. With virtually no training.



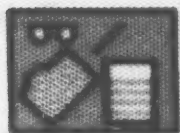
Now, 286/386™ machines running MS-DOS® will no longer be limited to 640K. So there are no more impediments.

Users can even enjoy a network connection and at the very same time satisfy the cravings of multiple applications.

ws 3.0



Networks



Desktop



Ports



Fonts

# a point and click hooked.

And since Windows 3.0 has a modular setup program, a single copy now memorizes every user configuration on the network. Which means, so to speak, one size fits all.

Furthermore, Windows 3.0 has redefined its relationship with IBM® 3270 emulation programs. Users can now download corporate data and easily share it with Windows applications. Something we have come to call peaceful coexistence.

One last point. Because Windows

3.0 has been optimized for machines with 1-2 megabytes of RAM, it will go a long way towards protecting your hardware investment.

Call (800) 323-3577, Department L21, for a backgrounder that outlines how Microsoft Windows 3.0 could benefit your corporation.

We're certain that you'll agree it's a habit well worth forming.

**Microsoft**  
Making it all make sense®



# XEROX

## Ventura Publisher introduces the Gold Series. It simply does more, any way you look at it.

And now there are several new ways to look at it. Because the desktop publisher that does more for you now does it all in the three leading PC environments.

The Gold Series introduces new Ventura Publisher® editions for DOS/GEM, Windows 3.0, and OS/2 Presentation Manager. That means new ease of use and learning as well as compatibility with hundreds more software applications. All three new editions can use documents from Ventura Publisher 1.1 and 2.0.

### **It does even more than before.**

The Gold Series gives you much more than a choice of environments. At no extra cost, each edition includes our Professional

Extension and Network Server. So you also get such advanced DTP features as interactive table creation and scientific equation editing, cross referencing, and vertical justification.

And you get networking. So several users can edit and proofread simultaneously as well as share stylesheets and network resources. On Novell, IBM, 3COM, and other Windows- and OS/2 Presentation Manager-compatible networks.

Whether you're designing a newsletter or publishing a directory, you'll do it faster and more effectively with Ventura Publisher. Unique features give you more flexible and precise type control, and automate many

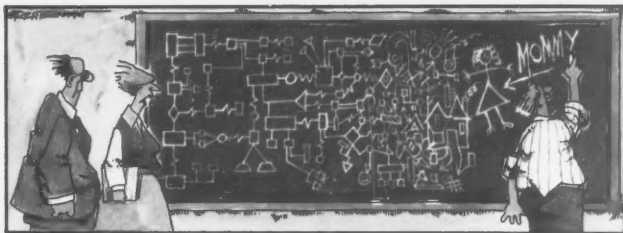
steps other programs make you repeat over and over. Ventura Publisher is the one DTP program that can handle all your publishing and design projects.

If you want to do more in desktop publishing, doesn't it make sense to use the program that does the most? Call today for more information about the new Ventura Publisher Gold Series. (800) 822-8221 in USA; (800) 228-8579 in Canada. For training information, call (800) 445-5554. Ventura Software Inc., a Xerox company.

**Ventura Publisher  
Gold Series**  
*It simply does more.*







"I THINK IT'S TIME HE GOT HIS OWN SUBSCRIPTION TO COMPUTERWORLD."

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$38.95\* per year — a savings of 62% off the single copy price.

First Name \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_

Title \_\_\_\_\_ Company \_\_\_\_\_

Address \_\_\_\_\_

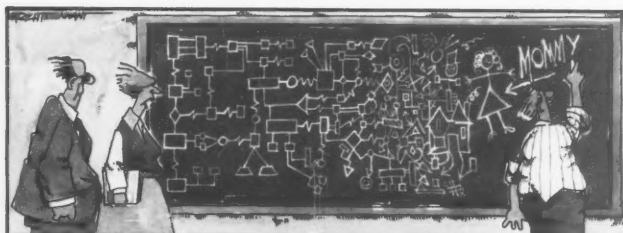
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48 per year

\*U.S. Only. Canada \$110, Central/South America \$130, Europe \$195, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

**COMPUTERWORLD**



"I THINK IT'S TIME HE GOT HIS OWN SUBSCRIPTION TO COMPUTERWORLD."

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$38.95\* per year — a savings of 62% off the single copy price.

First Name \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_

Title \_\_\_\_\_ Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48 per year

\*U.S. Only. Canada \$110, Central/South America \$130, Europe \$195, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

**COMPUTERWORLD**

1. BUSINESS/INDUSTRY (Circle one)
  10. Manufacturer (other than computer)
  20. Finance/Insurance/Real Estate
  30. Medicine/Law/Education
  40. Wholesale/Retail/Trade
  50. Business Service (except DP)
  60. Government - State/Federal/Local
  65. Communications Systems/Public Utilities/Transportation
  70. Mining/Construction/Petroleum/Refining/Agric.
  80. Manufacturer of Computers, Computer-Related Systems or Peripherals
  85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
  90. Computer/Peripheral Dealer/Distributor/Retailer
  75. User/Other \_\_\_\_\_
  95. Vendor/Other \_\_\_\_\_ (Please specify)
2. TITLE/FUNCTION (Circle one)
  - IS/MIS/DP MANAGEMENT
    19. Chief Information Officer/Vice President/Asst. VP
    21. Dir./Mgr. MIS Services, Information Center
    22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm.
    23. Dir./Mgr. Sys. Development, Sys. Architecture
    31. Mgrs. Suprv. of Programming, Software Dev.
    32. Programmers, Software Developers
    60. Sys. Integrators/VARs/Consulting Mgr.
  - OTHER COMPANY MANAGEMENT
    11. President, Owner/Partner, General Mgr.
    12. Vice President, Asst. VP
    13. Treasurer, Controller, Financial Officer
    41. Engineering, Scientific, R&D, Tech. Mgt.
    51. Sales & Mktg. Management
  - OTHER PROFESSIONALS
    70. Medical, Legal, Accounting Mgt.
    80. Educator, Journalists, Librarians, Students
    90. Others \_\_\_\_\_ (Please specify)
3. COMPUTER INVOLVEMENT (Circle all that apply)
 

Types of equipment with which you are personally involved either as a user, vendor, or consultant:

  - A. Mainframes/Supersystems
  - B. Minicomputers/Small Business Computers
  - C. Microcomputers/Desktops
  - D. Communications Systems
  - E. Local Area Networks
  - F. No Computer Involvement

E4044F-0

1. BUSINESS/INDUSTRY (Circle one)
  10. Manufacturer (other than computer)
  20. Finance/Insurance/Real Estate
  30. Medicine/Law/Education
  40. Wholesale/Retail/Trade
  50. Business Service (except DP)
  60. Government - State/Federal/Local
  65. Communications Systems/Public Utilities/Transportation
  70. Mining/Construction/Petroleum/Refining/Agric.
  80. Manufacturer of Computers, Computer-Related Systems or Peripherals
  85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
  90. Computer/Peripheral Dealer/Distributor/Retailer
  75. User/Other \_\_\_\_\_
  95. Vendor/Other \_\_\_\_\_ (Please specify)
2. TITLE/FUNCTION (Circle one)
  - IS/MIS/DP MANAGEMENT
    19. Chief Information Officer/Vice President/Asst. VP
    21. Dir./Mgr. MIS Services, Information Center
    22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm.
    23. Dir./Mgr. Sys. Development, Sys. Architecture
    31. Mgrs. Suprv. of Programming, Software Dev.
    32. Programmers, Software Developers
    60. Sys. Integrators/VARs/Consulting Mgt.
  - OTHER COMPANY MANAGEMENT
    11. President, Owner/Partner, General Mgr.
    12. Vice President, Asst. VP
    13. Treasurer, Controller, Financial Officer
    41. Engineering, Scientific, R&D, Tech. Mgt.
    51. Sales & Mktg. Management
  - OTHER PROFESSIONALS
    70. Medical, Legal, Accounting Mgt.
    80. Educator, Journalists, Librarians, Students
    90. Others \_\_\_\_\_ (Please specify)
3. COMPUTER INVOLVEMENT (Circle all that apply)
 

Types of equipment with which you are personally involved either as a user, vendor, or consultant:

  - A. Mainframes/Supersystems
  - B. Minicomputers/Small Business Computers
  - C. Microcomputers/Desktops
  - D. Communications Systems
  - E. Local Area Networks
  - F. No Computer Involvement

E4044F-0



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

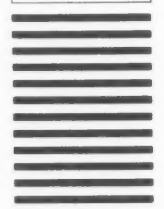
POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P.O. Box 2044  
Marion, Ohio 43306-2144



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P.O. Box 2044  
Marion, Ohio 43306-2144



# Micro orientation of SQLbase helpful

## PRODUCT REVIEW

Gupta Technology, Inc.'s SQLbase database server is micro-computer-oriented, so it offers a potentially less imposing approach to corporate database design than products adapted from mainframe database servers.

SQLbase runs under either DOS or OS/2. It comes with a C language call interface, a character-based interface for DOS and OS/2 and a Microsoft Corp. Windows front end. It supports ANSI Level I SQL, but its best features are those that are not ANSI Level I-compatible. Some, but not all, of these extensions are in ANSI Level II SQL.

SQLbase provides simple record-handling functions in a set-based environment. It lets users

er to take a snapshot of data in read-only mode. In Release Locks mode, data is not locked between the time it is read and the time the database is updated.

SQLbase has most of the basic relational features inherent in SQL, including the use of an on-line catalog that can be examined using SQL and tables and columns. However, some important relational features, such as referential integrity, are not supported. Additionally, Gupta's cost-based query optimizer is weak.

SQL cursors keep a user's place when he is sifting through the answer to a query. They also serve as a software-based communications link between client and server. Because ANSI-standard SQL cursors can only move forward through the data one row at a time, Gupta includes Result Set mode, which lets users access virtually any row in any order when the answer to a query is fetched.

Result Set mode works in conjunction with Restriction mode, which provides a quick means of refining the selection of records in a result set without having to go back and reissue a query on the entire table.

### Simultaneous connection

A single SQLbase application can connect a number of cursors to a database simultaneously, and each cursor can be used to process a different request, be it query, update, insert or other.

SQLbase shines in transaction processing. The performance speed remains almost flat from one station to 24. Only when transaction processing is combined with other update and insert operations does SQLbase show any significant degradation in performance.

SQLbase does not support some of the advanced features found in other products, such as stored procedures, triggers and

two-phase commit, but it does allow users to store commands in precompiled formats and chain commands for batch execution.

The latest release of SQLbase is Version 4.0.4. The documentation consists of the manual for Version 3.4 with three sets of error-filled release notes. The index is weak, covering only the oldest version of the manual. Examples are ambiguous and leave many questions unanswered.

The documentation is the biggest impediment to learning the SQLbase C language call interface, but SQLbase is actually very easy to install and equally easy to get working.

SQLbase supports transaction logging, rollback and automatic roll-forward recovery. SQLbase also supports save points, which allow users to roll back to intermediate points in a transaction.

Two methods of on-line backup are available: One takes a snapshot of the database and logs. The other lets users back up the database at a given point and archive the transaction logs.

SQLbase can also allocate disk space dynamically. However, Gupta does not supply a utility for recovering a database that might become corrupted if the system fails at the moment additional file space is allocated. Moreover, SQLbase lumps all possible disk errors into a single

category — read/write error.

Technical support is free for 90 days; after that, it costs \$300 per year for the DOS server or \$375 per year for the OS/2 server. Support lines are open from 7 a.m. to 5:30 p.m. Pacific time, and there is a bulletin board for support questions. Technicians are acceptable.

SQLbase server for OS/2 costs \$2,495 for unlimited users. The DOS version costs \$1,995.

Developers who started out on microcomputers will find SQLbase a more familiar development environment than those who have migrated from larger systems.

Gupta Technologies, Inc., 1040 Marsh Road, Menlo Park, Calif., 94025. (415) 321-9500.

### Gupta SQLbase Server Version 4.0.4

Price: \$2,495

- Performance: Poor - excellent
- Documentation: Unacceptable
- Ease of learning: Satisfactory
- Ease of use: Good
- Error handling: Poor - good
- Support: Poor - satisfactory
- Value: Satisfactory

process a query and then move to any record in the answer in any order. To make it easier to program interactive database access, Gupta's SQLbase engine supports a variety of locking mechanisms and an implementation of "scrollable cursors."

The four related lock levels are Read Repeatability, Cursor Stability, Read Only and Release Locks. Read Repeatability puts a shared read lock on all the pages accessed with a query. Cursor Stability locks only the page of data that the server is currently using in order to process a query. Read Only mode causes the serv-

## Micrographx

FROM PAGE 69

Dynamic Data Exchange facility as well as the Windows Clipboard. It makes intelligent use of the Windows 3.0 interface.

Charisma is faster at popping up dialog boxes and displaying menus than the usual Windows packages, but its drawing speed is a bit sluggish. It includes a wire-frame mode for better speed, and it allows users to continue work without waiting for redraws to be completed.

Data for numeric charts can be entered either by keyboard or by importing spreadsheet files from common spreadsheet programs. Charisma's numeric chart styles include area charts, horizontal and vertical bar charts and data tables.

More than one chart can be overlaid, stacked or arranged on one screen. Most charts have a three-dimensional option with a variable perspective.

Unfortunately, Charisma omits the capability to place standard error bars on charts. It also does not have a broken-bar option, and it could use more basic mathematical spreadsheet

functions such as calculation of smoothed averages, means, standard deviations and data frequencies.

With Charisma, text charts are assembled from the supplied templates. Bulleted charts use graphics symbols as bullets, making it possible to resize or recolor them at will. Charisma

### Micrographx Charisma Version 2.0

Price: \$495

- Documentation: Very good
- Ease of learning: Good
- Ease of use: Very good
- Error handling: Very good
- Support: Good - very good
- Value: Very good

comes standard with a first-rate selection of text fonts. All fonts can be resized, recolored, rotated or converted to graphic symbols and edited.

There is no built-in organizational chart routine. The blank organization framework has to be imported as clip art. Charisma also does not provide dedicated speaker's notes or audience handout facilities.

Charisma is closer to a chart-

ing package than a presentation package. Although it lets users view multiple images simultaneously and reorder these images, it does not have true presentation/organizing capabilities. However, Charisma's slide-show features are very good.

Charisma's output support is better than most Windows-based presentation packages.

Charisma's manuals are spiral-bound and well written but could be improved with color illustrations and more extensive indexes. There is an on-line, context-sensitive Help facility.

Even users who are familiar with Windows will need time to learn Charisma. Novice users may be a bit daunted by all the options and features. Once learned, however, the package is fast and efficient.

Micrographx offers unlimited technical support. Extended support costs \$150 per year. Hours are 7 a.m. to 7 p.m. Central time. The phone lines are not toll free. The technicians are courteous and provide competent answers. Charisma lists for \$495.

Micrographx, 1303 E. Arapalito Road, Richardson, Texas, 75081. (214) 234-1769.

## Lindquist

FROM PAGE 65

Of course, Lotus has a record for product prognostication that rivals government contractors.

You'd think the seeming deluge of such problematic products would be bringing the software industry, or at least the offending vendors, to a halt. It isn't. While firms in other high-tech areas fight recession, Software Publishers Association reports paint an ever-rosy revenue picture for PC software.

Who's to blame for this situation? Profit-fattened vendors swarming with executives ready to pull the ripcords on their golden parachutes if things get too tough? Marketing and sales departments making

pillow talk with buyers to get a sale? I say it's none of the above. I blame the users. They're taking all the abuse the software industry is giving them and begging for more.

Dbase IV Version 1.1 is a dramatic improvement over the previous release, but it is still several steps behind state-of-the-art. A compiler is the stuff of future versions, and tests show that Dbase falls far behind such products as Fox Software's Foxbase and Borland's Paradox in operational speed. Maybe Ashton-Tate can jump back in with the technological leaders, but its recent record doesn't make that a good bet. So why do users keep holding on?

It is often user inflexibility that allows vendors to produce poor products and take forever

to fix them (some even have the gall to charge an "upgrade" fee) while still watching their profits soar. Granted, after spending thousands of dollars acquiring and training a Dbase programmer or taking the time to train yourself, developing applications and training end users to operate them, it may seem foolish to grab another product off the shelf and start over.

Some companies have done this, though, and profited from it. In fact, Ashton-Tate's slip opened what was once only a crack in the PC database market to full-fledged nichehood. Several smaller vendors built their market shares while Dbase was in the repair shop. Nearly two years later, however, Dbase still holds the lead in the PC database market. Ashton-Tate led

with its chin and was tagged, but users waited out a 10-count long enough to make the most crooked boxer blush.

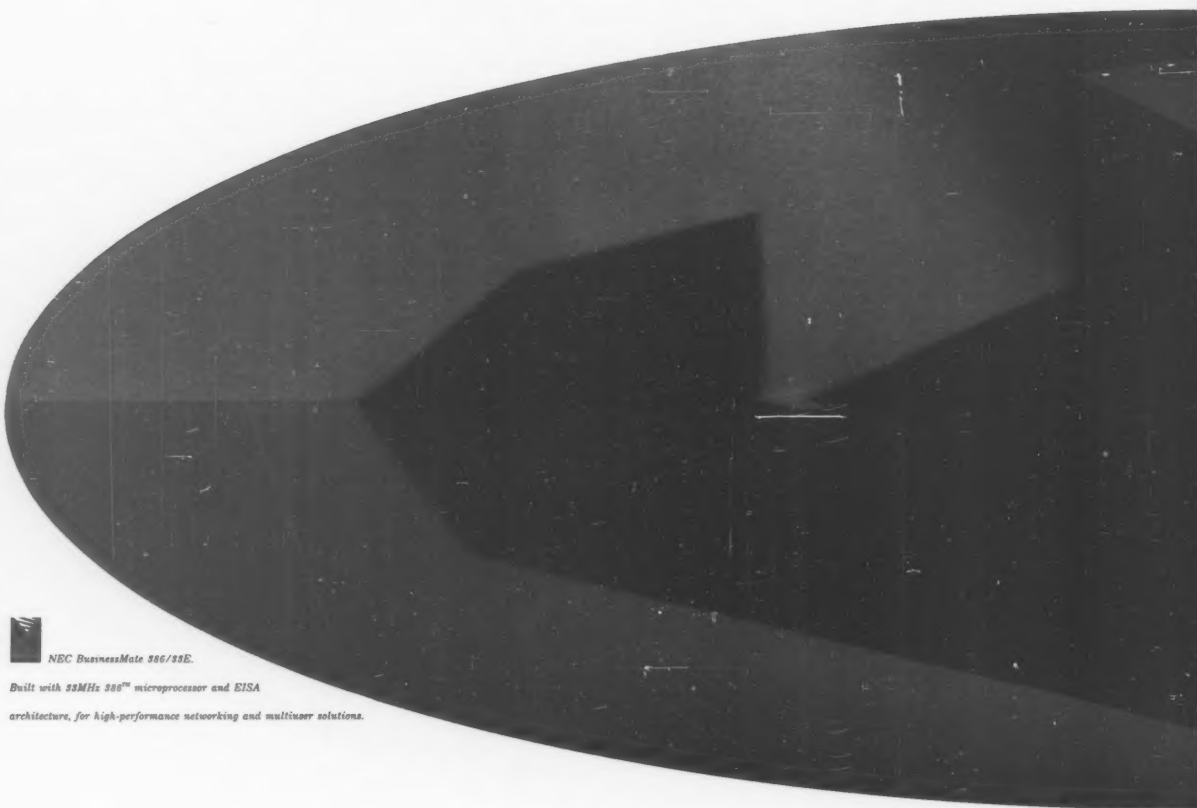
Perhaps a company the size of Ashton-Tate going down for the count would rouse the vendors from their profit-induced stupor. But maybe it wouldn't even take something that drastic. Maybe something positive would happen if more users began telling their sales representatives, "We've been testing similar products from The Other Guys, and they do X, Y and Z now. If you can't do that, we have alternatives." This would be aided by a few more vendors taking the Borland route of offering low-priced upgrades to owners of competing products and a few more users taking them up on the offer.

Users should constantly re-evaluate the reasons why they stay with faltering products. Is it really the cost or simply the inconvenience of the conversion? Do the short-term benefits of sticking with a platform, even if the vendor seems to have deserted you on it, outweigh the long-term gains of using a superior product? I'm not trying to promote jumping ship at the first sign of a leak, but there's no reason not to familiarize yourself with the life preservers.

Something needs to light a fire under the established members of the PC software industry. They've been piling on the fuel, but it's the users who hold the matches.

Lindquist is a *Computerworld* copy editor.

# Perhaps its best fea



NEC BusinessMate 386/33E.

Built with 33MHz 386™ microprocessor and EISA

architecture, for high-performance networking and multiuser solutions.

If you see networking and multiuser solutions in your company's future, there's no better investment than the NEC BusinessMate® 386/33E. Because it gives you the performance, capacity and expandability these environments demand.

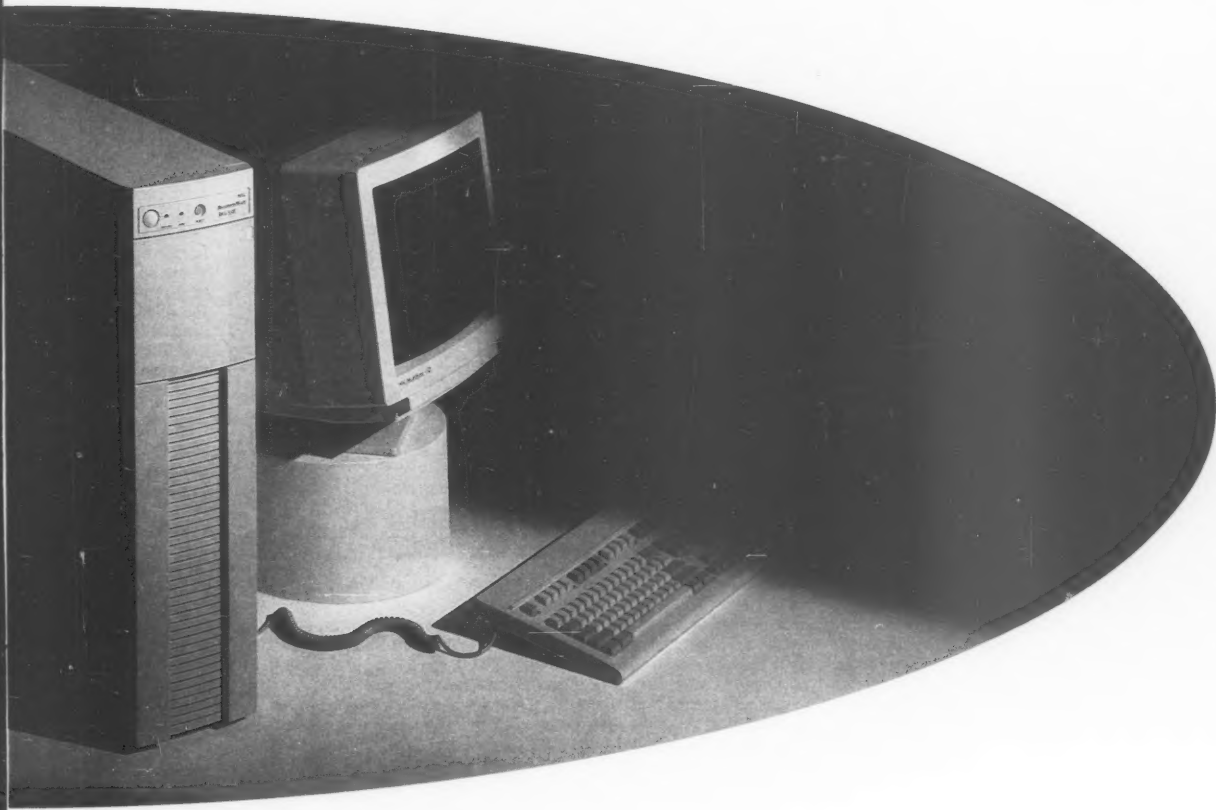
It comes with 4MB or 8MB of RAM, a 64KB SRAM cache, and room for three full-height and three half-height storage devices. Its 32-bit EISA architecture accepts 8-, 16- and 32-bit cards among eight



Computers and Communications



ture is its future.



expansion slots. And its NEC Host Adaptor supports up to seven SCSI devices, for increased flexibility with no sacrifice in performance.

In short, with support for thousands of applications, you'll have the power to make your system grow and change as your needs do. Best of all, you'll have a system that offers something no one else can offer at any price: NEC. Which may be the most attractive feature of all.

For more information, call 1-800-NEC-INFO.

**NEC**

# City cops take byte out of crime

Dallas police force adds mobile data terminals to its anticrime arsenal

## ON SITE

BY CLINTON WILDER  
CW STAFF

At 10:40 p.m. on an oppressively hot late summer night, Dallas Police Officers David Vestal and Don Waterson steer their patrol cruiser toward "Crack Alley" — their nickname for a northwest Dallas housing project known as a hotbed for drug dealers. When they spot several men congregated on a sidewalk ahead, Vestal zooms in and screeches the car to a stop, scattering the men to their various hiding places as if fleeing a live grenade.

At the same time, the officers spot a suspicious car across the street. From the passenger seat, Waterson quickly enters the license number into a formatted screen on the cruiser's mobile data terminal. "C'mon, come back stolen for me, baby," Vestal says as Waterson hits the transmit key.

In seconds, the terminal beeps and the small screen glows with the car's registration data, owner's name and address. But there are no warrants; it's clean. "Damn, not this time," Vestal says.

### Crime-fighting tools

Every day and night, more than 1,000 police officers cruise the streets and highways of Dallas with computer technology on board. Each patrol car is equipped with a mobile data terminal from Mobile Data Interna-

tional, Inc., in Vancouver, B.C. Mounted near the middle of the dashboard and linked via an 800-MHz cellular radio frequency to an IBM 3083E in the Dallas City Hall data center, the terminal is as much a part of the crime-fighting arsenal as the 12-gauge shotgun on the floor next to it.

"We work the crud out of it, that's for sure," Vestal says.

The mobile terminals are just one piece of a law enforcement technology infrastructure that made the city of Dallas the first municipality to win a Partners in Leadership Award from the Society for Information Management [CW, Aug. 6].

Assistant Police Chief Leslie Sweet and Director of Information Services David J. Morgan were honored for the \$10.2 million crime-fighting system that also includes cellular telephones in patrol cars, automatic location identification on 911 calls and computerized fingerprint matching. It is information technology for which the "payback" is measured in murder arrests or rape convictions.

Vestal and Waterson have been partners for about two years, which is a long time on the Dallas patrol force. The city is a tough place to be a cop; the crime rate is high, police/community relations are among the most volatile in the U.S., and the department was rocked recently by the indictment of Police Chief Mack Vines on a perjury charge.

Vestal and Waterson spend much of their evening patrol on

Harry Hines Boulevard, a broad avenue where prostitutes, known by name to the officers, work their own evening shifts in cheap motel rooms or cars in deserted parking lots. Cruising through the stifling heat with air conditioning and rock music going, Vestal and Waterson make constant use of their on-board,



Dallas cops measure mobile terminal payback in felony arrests

on-line computer link.

The most common use is license plate checks for stolen car warrants. At 7:15 p.m. on the Stemmons Freeway, Vestal sees a car suddenly veer onto an exit ramp. He recites the plate number to Waterson, who immediately enters it.

The car comes up clean on the on-line query. "Probably just a kid without his license," Vestal says with a sigh. The ability to

check licenses without voice communication to a dispatcher has doubled the number of checks that reveal a warrant on the car or its owner. "We'd never ask a dispatcher to run as many requests as we do now," Waterson says. "We'll run makes that are the big cars to steal around here, or anyone that just looks a little out of place for some reason."

If a car is stopped, the mobile terminal can give the approaching officer information about whether the driver may be

time they return to the car after answering a call — checking a burglar alarm, for example — Waterson logs on and sees a list of outstanding calls to be answered. Top priority calls appear in a different color. The officers can key to another screen for more details on a particular situation, or ask the dispatcher about it verbally, or both. They also trade messages with other patrol cars — electronic mail on the roads.

Since the terminals were installed in 1987, Vestal remembers some vivid examples of the technology at work. In one case, he and Waterson responded to a report of gunshots in the rough Crack Alley area and found two prostitutes had been shot, one fatally.

A witness had seen a license plate number as the gunman sped away. The computer check revealed that the car was registered in the town of Bedford, Texas, and Bedford police were alerted on the chance that the culprit would return to his residence. He did — and was arrested for murder the same day.

That is the kind of challenge that Vestal and Waterson face fairly often, but this is a slow night. The officers decide to call it quits about 11:30 p.m.; they're both due in court early the next morning to testify in a drug case. Before returning to the station, however, they check the terminal screen for any new calls.

## Manzi

FROM PAGE 65

Manzi quipped while speaking before the New York PC User Group two weeks ago. On a more serious note, he stressed that the notion of intellectual property is not only important, but that it lies at the heart of the software industry.

"Our industry is one that has been built by creativity and innovation," Manzi said. Noting that the main purpose of a copyright is to reward and encourage innovation, he termed as "strange" charges that copyright protection stifles innovation or infringes on programming freedom.

The real issues, according to Manzi, lie in how best to reward creativity, ensure competition and encourage the continued innovation on which users and the industry depend.

Manzi maintains that if various elements in new software are not protected by copyright, small developers in particular would lose out. "Without copy-

right protection, you can imagine what would happen. The first time a developer demonstrated an attractive new product at [a trade show], hundreds of programmers . . . would quickly hunker down to create their own versions." In short, he said, any big developer could quickly put together and heavily market a

**"WE ARE** talking about protecting a complex work, not just a small piece of work."

JIM MANZI  
LOTUS

clone, robbing the developer of the value of his creative efforts.

The end result of this diluted reward, he claimed, would have to be fewer creators and fewer new products; thus, users would also lose out. Consequently, Lotus sees "nothing wrong with standing up for [its] rights in a

highly competitive marketplace," he said.

Manzi also pointed out that Lotus "has always encouraged the use of our products to develop other products. It's in our interest to do so." As he noted, 1-2-3 has spawned a whole submarket of add-ins, add-ons and other related packages. Lotus is not against anyone taking 1-2-3 and putting it to use in development, he said.

"But we are against someone taking the core of our product, marketing it as part of their product and taking money from us. That's unfair, that's against the law, and that's the sort of thing, if it goes unchecked, that would have the effect of stifling innovation," Manzi said.

He also took a shot at the popular euphemism "look and feel," calling for its ban. "That unfortunate phrase" has been the biggest single source of confusion in the whole debate, according to Manzi, who claimed it "conveys the notion that what is at issue is highly subjective and insubstantial."

This is not the case with the

Lotus suits, he claimed: "We are talking about hundreds of different commands that are tied together in a particular way. We are talking about protecting a complex work, not just a small piece of work . . . or every little piece of a command structure."

The industry needs to understand that the menu commands and structure for an application, which is what Lotus says it is try-

### MICRO BITS

## USAF leans toward Zenith

The U.S. Air Force Standard Systems Center at Gunter Air Force Base in Montgomery, Ala., expects to award Zenith Data Systems (ZDS) the contract for its Standard Software Requirements Contract 1. Estimated at \$21.9 million, the pact is to be awarded in November pending approval. ZDS is expected to supply more than 300,000 upgrades to 19 software packages. They will be used by desktop computers purchased by the Air Force, Navy, Army and De-

fense Logistics Agency.

**Interactive Systems Corp.**, which markets a version of Unix System V, Release 3.2, will market Lotus Development Corp.'s 1-2-3 Unix System V.

**Compaq Computer Corp.** has signed integration agreements with business partners Microsoft Corp., Novell, Inc. and The Santa Cruz Operation, Inc. These pacts provide joint development training and marketing.

Get the real thing  
for the price of a reproduction.

See us at  
COMDEX/FALL '90  
Booth #1842, Las Vegas  
Convention Center



## microLaser™ PS17 from Texas Instruments: True PostScript® printing for only \$2,349\*:

Now you can afford the powerful font and graphics capabilities of the industry-standard PostScript software from Adobe®.

The microLaser PS17 features true Adobe PostScript printing so you don't have to settle for an imitation that costs about the same, but gives you less. Plus, microLaser offers these other advantages:

**17 Scalable fonts.** Plenty to get you started. If you need more, choose the microLaser PS35 model, with 35 PostScript fonts. Both models feature the new Adobe ATM™ font rendering technology, which improves the quality of PostScript fonts and prints them significantly faster.

**The industry standard.** With microLaser and PostScript, you can access more than 600 high-quality typefaces and over 4,000 software applications. It's also compatible with the HP LaserJet® Series II and allows you to switch between the HP and PostScript modes easily. Plus, you can connect microLaser to your PC, Macintosh® or virtually any type of computer hardware.



### Superior paper handling.

microLaser's paper drawer holds 250 sheets — and it conveniently slides inside the printer to save space. An optional, second 250-sheet paper drawer and envelope feeder are available for extra versatility.

### The smallest footprint you'll find.

At only 13.4" wide and 14.2" deep, microLaser offers what BYTE magazine calls, "an exquisitely small footprint and a

compact design, destined for a cramped desktop."\*\*

If you're not ready for PostScript yet, you can buy the standard microLaser for \$1,799\*. Then as your needs grow, so do microLaser's capabilities — without tools or technicians. Just add upgrade boards for PostScript software, more memory and optional interfaces. Or plug in microCartridges for additional fonts and emulations.

With all of this capability, why settle for less than the microLaser with PostScript?

Call us for additional information and the name of a dealer near you.

**1-800-527-3500.**

**TEXAS  
INSTRUMENTS**

© 1990 TI 66109

\*TI suggested list price. \*\*BYTE Magazine, July 1990 issue. microLaser is a trademark of Texas Instruments. ATM is a trademark and Adobe and PostScript are registered trademarks of Adobe Systems, Inc. LaserJet is a registered trademark of Hewlett-Packard, Inc. Macintosh is a registered trademark of Apple Computer, Inc.

# Free Your Or The Limitations Of





# ganization From Conventional Systems.

## Introducing Cooperation.<sup>™</sup> The Open Enterprise Integration Environment.

Conventional systems have spawned islands of information that separate departments and impede workflow more effectively than any wall.

The answer is NCR Cooperation. Software that integrates the general-purpose applications and platforms in your organization into one flexible, cooperative system with a consistent, intuitive graphic interface.



Cooperation benefits everyone in your organization. It lets MIS managers integrate multimachine, multivendor, multi-standard environments, with the tools needed to create and manage a complete enterprise-wide network.

Its Business Information Monitor facilities allow executives to access the entire knowledge base of the enterprise from their own workstations.

And it aids software developers by speeding both new application development and the extension of current mainframe and minicomputer applications.

Cooperation allows access to your enterprise's resources from every desktop. It features powerful tools, including the latest in distributed *object* technology, that insulate both software developers and users from the complexities of the operating environment. Object-oriented programming lets developers reuse code, easing the job of building or modifying complex programs. And reducing the time and cost of development and training.

Cooperation can set your organization free from the rigid, hierarchical computer architectures of the past. Free from dependence on the vision of a single vendor. Free to meet the challenges of the future as you see fit.

To unleash the power of Cooperation in your organization today, phone 1-800-CALL NCR.



Open, Cooperative Computing.  
The Strategy For Managing Change.

## NEW PRODUCTS

## Unix software

Unitech Software, Inc. has announced a password management and control package designed for Unix-based systems.

Upass includes transparent password control and automatic reporting features that provide system administrators with more security for their Unix systems. The software package runs on Digital Equipment Corp., Sun Microsystems, Inc., Hewlett-Packard Co., Unisys Corp. and other platforms.

License fees range from \$1,000 to \$4,000, depending on CPU size and type

of Unix version supported.

**Unitech Software**  
1800 Alexander Bell Drive  
Reston, Va. 22091  
(703) 264-3301

## Development tools

Software Products International, Inc. has announced the Open Architecture Development System, a C-language interface that enables developers to incorporate original features or make changes to the existing functions and interface of its Open Access III database-oriented multi-function business software package.

The product comprises a set of C libraries that provide users with complete access to Open Access III's internal routines, thereby enabling users to make customizations to Open Access III's modules and applications.

The product and reference library can be purchased separately for \$595 or as part of the Open Access III Developer's Tool Kit for \$995.

**Software Products International**  
10240 Sorrento Valley Road  
San Diego, Calif. 92121  
(619) 450-1526

## Data storage

Mass Microsystems, Inc. has announced the Optipak, a magneto-optical disc drive

designed for Apple Computer, Inc. Macintosh systems.

The product provides 512M bytes of storage on a removable, rewritable cartridge and uses a noncontact laser read/write system that will not deteriorate data, regardless of how often the data is erased or rewritten, the vendor said. It can be used for desktop publishing, computer-aided design and manufacturing and multimedia, archival and backup storage. It costs \$4,349.

**Mass Microsystems**  
810 W. Maude Ave.  
Sunnyvale, Calif. 94086  
(408) 522-1200

## Board-level devices

AST Research, Inc. has announced a 16-bit version of its Sixpak 286 memory board.

Features include support for expanded memory specification 4.0 hardware, flexible memory configuration up to 4M bytes and expandable random-access memory. An optional piggyback I/O module is also included. The product costs \$169.

**AST Research**  
P.O. Box 19658  
16215 Alton Pkwy.  
Irvine, Calif. 92713  
(714) 727-7960

Ventek Corp. has announced a video digitizer board that features 24-bit color capability.

The VIP 640C was designed for use in an IBM Personal Computer AT or compatible equipped with Industry Standard Architecture, an Intel Corp. 80286, 80386 or i486 processor; and IBM Video Graphics Array-compatible display capabilities. It can capture 640- by 480-pixel resolutions with color resolutions of up to 24 bits, the vendor said.

The product has a list price of \$449.

**Ventek**  
31336 Via Colinas  
Westlake Village, Calif. 91362  
(818) 991-3688

Ward Systems Group, Inc. has announced a neural network accelerator board based on a reduced instruction set computing workstation with a digital signal processor, running at 25 million floating-point operations per second.

The Neuroboard can run Ward's Neuroshell software 100 times faster than a 20-MHz Intel Corp. 80386 processor equipped with a math coprocessor, according to the vendor. It performs multiple overlapping multiply/add instructions and features a range of memory sizes.

Prices range from \$1,695 to \$3,295.

**Ward Systems**  
245 W. Patrick St.  
Frederick, Md. 21701  
(301) 662-7950

## Software applications packages

Wang Laboratories, Inc. has introduced an expert system-based application development tool that enables users to create, distribute and maintain decision-making or problem-solving applications in work-group or companywide environments.

Commonknowledge runs on IBM Personal Computer ATs, compatibles or Micro Channel Architecture-based systems. The product is available in two packages:

*Continued on page 84*

**"Scuba tanks are  
all alike. Buy the cheapest  
one you can find."**

Floppy disks are not all alike. For vital data, some brands are simply out of their depth.

But you can breathe easy with Dysan 100. We test 100% of our disks and certify 100% to be 100% error free over 100% of the disk surface.

The Dysan 100. It's not just a name. It's a measure of superiority.



Red is COMPAREX.

You don't need to color all your judgements blue.  
Thinking red gives you more flexibility and the freedom  
to make your own decisions.

Our skill is the ability to see all the angles. By matching  
the spec, but perhaps offering a smaller footprint.

By addressing your computer productivity via the  
peripherals rather than boosting CPU.

Or maybe simply having a greater appreciation  
of the size of the pocket.

## IF YOU FEEL TOO BLUE, TURN TO RED.

So if you are worried at being baulked by the blue, go for  
the Red. With the backing of BASF and Siemens,  
it's one of the strongest colors in computing.

COMPAREX Informationssysteme GmbH

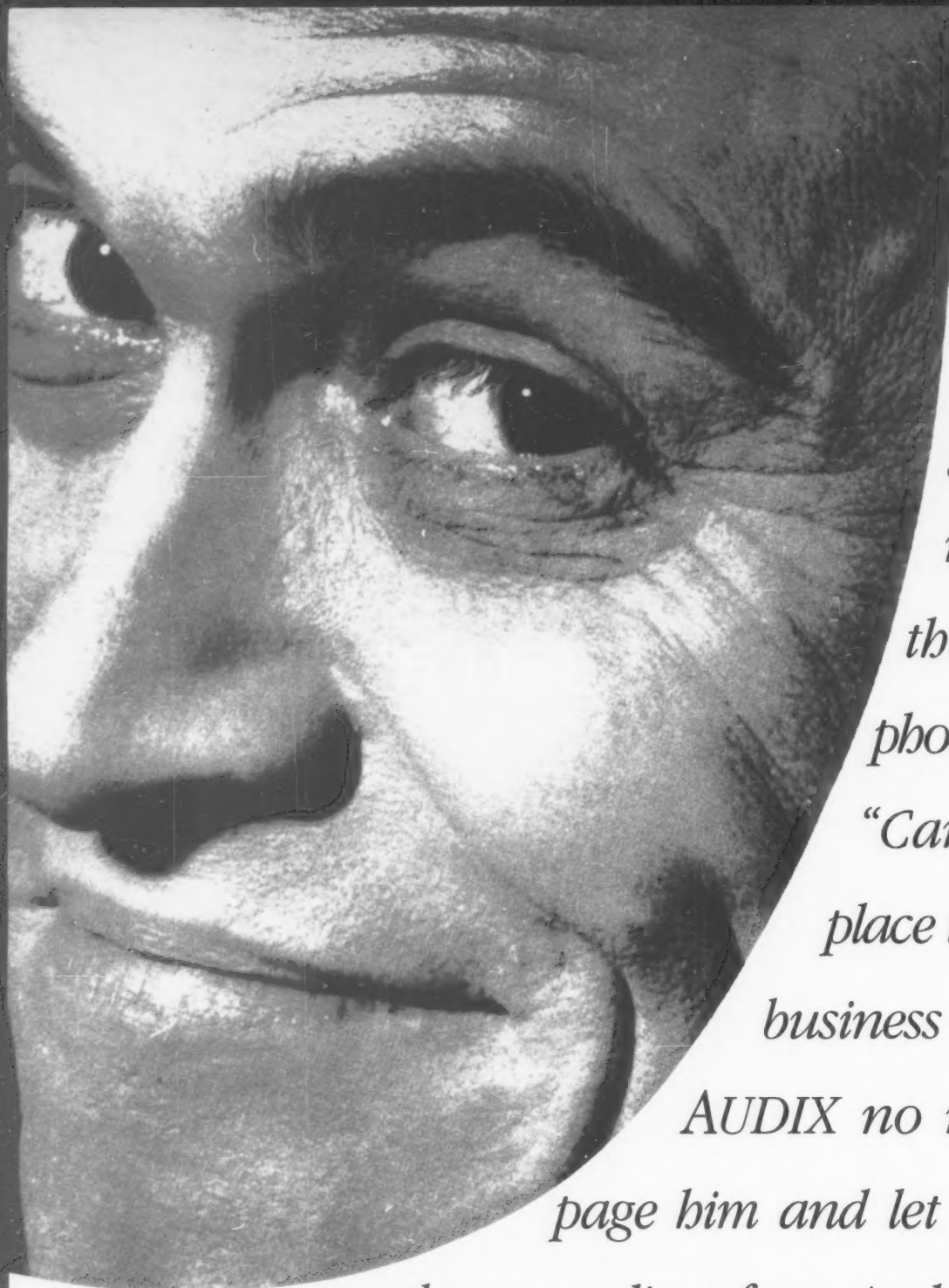
Gottlieb-Daimler-Str. 10

D-6800 Mannheim 1, Germany

Phone 0049-621 -4009-0, FAX 0049-621-4009-744

COMPAREX: The Intelligent Solution.





*We send  
put an  
And it  
this smoke  
gets there?  
reason I'm  
third call to  
phone because  
"Can I take a  
place that has an  
business calls don't*

*AUDIX no message is  
page him and let him know*

*tant because aliens from Andromeda are*

*At this point I'm put on hold. And it is my hope that if  
not currently suffering the indignity of the hold button.*

© 1990 AT&T

AT&T AUDIX SYSTEM is compatible with other major PBX systems and Centrex. It features Caller-Routing, Personal Mailing Lists, and a host of other features you'll find in THE AT&T CATALOG — For more information or a free catalog call 1 800 247-1212, Ext. 111. In Canada call 1 800 387-6100.



*up satellites like flowers to strangers. On one we  
electronic greeting card and addressed it to infinity.  
occurs to me, what if the people who might get  
signal from planet Earth aren't around when it  
What if they're in a meeting? And the only  
thinking this is because I'm on the tenth ring of the  
this supplier when someone finally answers the  
the ringing noise is ruining his lunch. He says,  
message?" And I say, "Tell Ray he needs to work for a  
AUDIX System from AT&T. Tell him 75% of all  
reach their intended party on the first try. But with  
missed. Tell him AUDIX features outcalling that can  
important messages are waiting. And this is impor-  
trying to reach him and they may not call back...."  
there is intelligent life somewhere in the universe, it is*



**AT&T**

The right choice.

*Continued from page 80*

A development component (\$950) includes a set of applications-building tools, and a runtime component (\$150 per user or \$750 for a site license) allows users to run applications developed with CommonKnowledge. **Wang Laboratories**  
One Industrial Ave.  
Lowell, Mass. 01851  
(508) 459-5000

Information Retrieval Methods, Inc. has released Version 3.0 of Enter/Face, a development/management system for handheld terminal data collection systems.

The product includes a project management system that automatically generates communications scripts while an application is being built, a mouse-driven command generator that

incorporates pull-down menus and windows and a terminal configuration feature, according to the company.

Enter/Face Version 3.0 costs \$4,000 and is also available from value-added resellers.

**Information Retrieval Methods**  
1525 N. Stemmons  
Carrollton, Texas 75006  
(214) 242-2312

Power Up Software Corp. has announced Express Publisher Version 2.0, a software package designed for users of IBM Personal Computer XT, ATs and compatibles.

The product includes Text Effects, a graphics module that enables users to create headlines or logos with sophisticated type-setting effects, such as manipulating text to fill a polygon or

bending text along a curve.

Express Publisher Version 2.0 is priced at approximately \$160.

Registered users of Express Publisher can upgrade their systems for \$34.95.

**Power Up Software**  
2929 Campus Drive  
San Mateo, Calif. 94403  
(415) 345-5900

## Software utilities

Now Software, Inc. has announced Now Utilities Version 2.0, an upgraded version of its utility software package designed for Apple Computer, Inc. Macintosh systems.

The product includes Super Boomerang, a commercial version of Hiroaki Yamamoto's Boomerang product. Super Boomerang was designed to accelerate navigating and searching in open and save dialogues. It also features Screen Locker, which protects users' confidential data, and Multimaster, which facilitates file and application launching.

The product costs \$129.

**Now Software**  
520 S.W. Harrison St.  
Portland, Ore. 97201  
(503) 274-2800

Adlersparre and Associates Consulting, Inc. has announced a product designed to allow systems running under PC-DOS or MS-DOS to load and unload memory-resident software such as terminate-and-stay-resident programs and device drivers.

Dynamic Memory Control can note memory pieces in conventional or high memory and remove programs loaded in these pieces at any time, the vendor said.

The product includes software on 5¼- or 3½-in. diskettes and is priced at approximately \$40.

**Adlersparre and Associates**  
1803 Douglas St.  
Victoria, B.C.  
Canada V8T 5C3

## Peripherals

Matrox Electronic Systems Ltd. has announced Image-CLD, a color digitizer that features the ability to convert 24-bit data into 16-bit red-green-blue data.

The device was designed to be linked to Matrox' Image series of image processing and graphics boards. The product can support applications that require color acquisition, including page layouts and machine vision. It can also scan and convert interlaced video and prepare it to be displayed as noninterlaced images, the vendor said.

Image-CLD is priced at \$1,995.

**Matrox Electronic Systems**  
1055 St. Regis Blvd.  
Dorval, Que.  
Canada H9P 2T4  
(514) 685-2630

Now you can get a lot more muscle out of DB2.\* With RAMIS.\* The most powerful tool on the market for accessing, reporting and maintaining DB2 data.

But despite its high performance, RAMIS is exceptionally easy to learn, easy to use and easy to teach. And best of all, easy to support.

It's menu-based, so it doesn't require DB2 or SQL/DS structures or commands.

From either RAMIS/PC or the mainframe,

# RAMIS. Think Of It As A Turbo-Charger For DB2.

RAMIS has powerful reporting capabilities that allow DB2 users to select the type of reporting facility uniquely designed for their own needs and experience.

And RAMIS provides quick data maintenance capabilities and automatic data extraction and data retrieval safeguards.

If all this wasn't enough, On-Line Software offers the MIS professional yet another powerful set of tools: The DB2 ProSeries—the perfect complement to RAMIS.

With one of the largest installed bases of any report writer in the world, RAMIS is backed by On-Line Software's over twenty years of leadership in IBM® systems software and its commitment to superior support, education and consulting.

Indeed, if RAMIS were a car, it would be a Ferrari.

For information, call 800-642-0177.

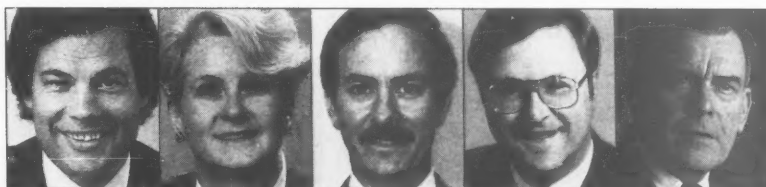
In Canada, call 416-620-4844. Outside U.S. and Canada, call 44-71-631-3696.

**On-Line Software**  
INTERNATIONAL

© 1990, On-Line Software International, Inc.  
RAMIS is a registered trademark of On-Line Software International, Inc.  
IBM is a registered trademark of International Business Machines Corporation.  
\*Indicates a trademark of IBM Corp.

RM-0179-01-9/13/90

# To maximize the millions you've spent on computers, spend three days with us.



Michael H. Spindler  
Executive Vice President, COO  
Apple Computer, Inc.

Ellen M. Hancock  
VP & Gen. Mgr. Comm. Sys.  
IBM Corporation

Gary Stimac  
Sr. Vice President  
Compaq Computer Corporation

Michael R. Hallman  
President  
Microsoft Corporation

Charles E. Esley, Jr.  
Chairman, CEO  
NCR Corporation



Enzo Torresi  
President, CEO  
NetFRAME Systems, Inc.

Katherine M. Hudson  
VP & Dir., Corp. Info. Systems  
Eastman Kodak Company

Bill Hysinger  
Dir. Information Systems  
Aldus Corporation

Brigitte Morel  
Vice President & Director  
Dataquest Europe, SA

William Hasler  
Vice Chairman  
KPMG Peat Marwick



INTERNATIONAL  
TECHNOLOGY  
SUMMIT

Businessland is gathering the best minds of the industry to discuss the most pressing issues of the day—namely, downsizing corporate systems, client/server computing and the outsourcing issue.

And you're invited to pick the brains of the experts.

Our International Technology Summit will be held on December 5-7, 1990, at the INFORUM in Atlanta, Georgia, USA. Call 1-800-328-8383 for a conference brochure and registration information. It will be the most profitable three days you've ever spent.

**BUSINESSLAND**

## THE CODEX 3380 19.2KBPS MODEM CAN SAVE ENOUGH ON LINE COSTS TO PAY FOR ITSELF.

If your throughput requirements keep increasing, but you think moving up to 19.2Kbps costs too much, here's good reason to think again:

A Codex 3380 19.2Kbps modem costs only \$2,995 (quantity one). If your line costs are \$12,000 a year, a pair of Codex 3380s pay for themselves in as little as six months. The more lines you use, the more reason to upgrade right away.

$$\begin{array}{rcl} \text{COST OF 2} & \text{ANALOG-BASED} & \text{PAYBACK} \\ \text{CODEX 3380s} & \div & \text{LINE COST} = \text{PERIOD} \\ \$5,990 & \div & \$12,000 \quad .5\text{YR OR 6MOS.} \end{array}$$

## THE MOST VALUABLE FEATURE OF ALL IS CODEX QUALITY.

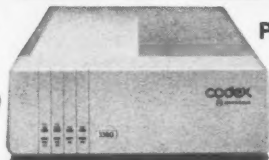
\$2,995 for a Codex 3380 buys you more than just line savings. You're buying Codex performance and reliability. Which means you get 19.2Kbps throughput all the time, not just at peaks. There's an optional feature that provides automatic dial restoral when line conditions degrade. And you get our priority on-site one year warranty.

To learn more, send in our coupon or call 1-800-426-1212 ext. 7229.

# BUY THIS MODEM AND GET YOUR MONEY BACK.

Call 1-800-426-1212  
ext. 7229

Or mail this coupon to:  
Codex Corp., Dept M2-380  
20 Cabot Blvd.  
Mansfield, MA 02048



Please send me information about  
how quickly the Codex 3380  
19.2Kbps modem pays for itself.

**codex**  
MOTOROLA

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Zip \_\_\_\_\_

I currently plan to purchase \_\_\_\_\_ modems within the next \_\_\_\_\_ months. ☐ Please tell me about your quantity discounts.



# NETWORKING

## COMMENTARY

Jeffrey N. Fritz

### 'Hey, anyone seen Coach?'



For just a moment, try to imagine CBS football commentator John Madden as a LAN specialist.

Touring your state-of-the-art data center, Madden excitedly proclaims, "Holy Cow! Look at all these high-powered networks running here. There's an Ethernet wide open on a crossing pattern. And throwing a great block on the right side of the line is a token-ring. Look at that! Charging in from the backfield is an Appletalk network. There are lots of options on the field, including great plays by bridges, gateways, routers and brouters. There are even plans for new plays from something called FDDI. But, hey, there's no coach on the sidelines! Who's out there managing all this stuff?"

Madden's question would be appropriate in many LAN network operations. Who is out there managing all this stuff? Tremendous growth has occurred in LAN technology, but network management, the control and monitoring of network performance, has been conspicuous by its absence. Even with the leaps and bounds made in networking over the last six years, network management

*Continued on page 96*

## Rolling along with Netview

BY ELISABETH HORWITT  
CW STAFF

A major railway carrier has been handing IBM's Netview more and more responsibility for managing a multimainframe network with 20,000 terminals that in turn coordinates shipments across 22,000 miles of track.

"The benefit we've seen is that Netview lets you get a very early picture across a spectrum of activities — in our case, the mainframes and the network," said Doug Underhill, assistant vice-president of technical services at the railway carrier's

CSX Technology subsidiary.

CSX Corp., which is said to be the largest railroad carrier in the eastern U.S., uses networked IBM 3090 mainframes to track the disposition of CSX's railcar fleet on a real-time basis, 24 hours a day. The hosts also interface with a process control system that manages the automated switch and signal network for CSX's railway network.

The interface allows the hosts to collect information about physical train activity and coordinate it with changing delivery priorities. This can be crucial, given that many shipment con-

tracts invoke penalty clauses when a carrier fails to deliver within minutes of the agreed time.

The major thrust of CSX's network management strategy right now is toward "automation, using the system as a self-regulating mechanism," Underhill said.

CSX has been using a variety of tools to develop applications



CSX's Underhill manages rail net

under Netview that automate "a significant portion of our operations," Underhill said. The com-

pany has been generating applications to automate management tasks using IBM's C List programming tools and, since it was released as part of Netview, the Rexx programming language. In addition, CSX has implemented two Netview programs, Automat-

ed Console Operations and Automated Network Operations, to minimize the need for human intervention in system and network monitoring, respectively.

"Something in excess of 90% of the messages that used to appear on the console daily don't appear any more; they are intercepted by Netview," Underhill said.

### Snowed under

Before the implementation of the above systems, operators at mainframe consoles were bombarded with more than 500,000 messages daily.

Indeed, Netview "now does virtually all recovery from most recoverable types of failures, from loss of [Job Entry Subsystem transactions] to a line failure," Underhill added.

In addition to detecting and responding to a widening range of network and system events, Netview has been "scripted" to collect documentation, to reload software on the front-end processor, and to re-initiate host operations after a system failure, Underhill said.

## T1 TO ISDN TRANSITION

### Hybrid nets gaining favor

BY JOANIE M. WEXLER  
CW STAFF

It's not happening in droves yet, but many companies are preparing to save a significant chunk of change and gain new networking capabilities by migrating some or all of their private T1 networks to public Integrated Services Digital Networks (ISDN).

Bunge Australia Proprietary Ltd., headquartered in Melbourne, Australia, is transitioning its entire 10-node T1 network to ISDN and anticipates a drop in annual telecommunications costs from \$2.2 million to \$900,000 (in Australian currency), according to Ramsay Gunasekera, group business systems manager.

As user firms face a burgeoning need to interconnect their local-area networks over wide geographical areas, they are starting to consid-

*Continued on page 90*



Cindy Patrick

**Announcing the arrival of your favorite MVS text editor on OS/2!**

# SPF/2™

#### TRUE MAINFRAME COMPATIBILITY

SPF/2 offers true ISPF/PDF compatibility to the MVS and COBOL programmer.

SPF/2 is written specifically for OS/2 using virtual memory to handle very large files, multi-process technology for split screens, and an interface to IBM's REXX as a macro language.

#### MACRO INTERFACE TO REXX

SPF/2 includes 75 ISREDIT commands that interface with IBM's REXX. You may use these to write your own commands in REXX and, if you wish, assign them to the 48 programmable function keys.

Existing mainframe REXX edit macros may be downloaded to run with SPF/2 and CLIST macros may be easily converted to REXX.

SPF/2 is compatible with OS/2 Standard and Extended Editions, Versions 1.2 or later. However, Standard Edition users will not have access to macro capabilities due to the unavailability of REXX in that environment.

#### 3270 COMPATIBILITY

SPF/2 processes keystrokes in the same manner as the OS/2 Extended Edition 3270 Emulator, including NEW-LINE, ENTER and status display indicators.

#### FREE DEMONSTRATION DISKETTE

Prove it to yourself. Call our toll-free, 24-hour Demo Request hot line at (800) 648-6700 for a free real-working-code demonstration disk.

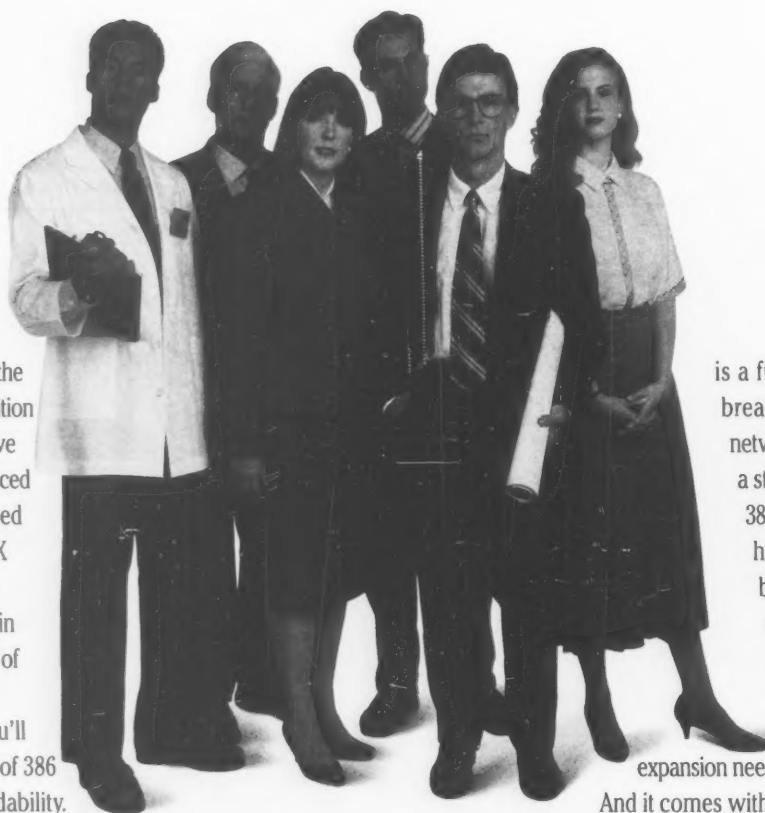
#### MULTI-USER LICENSE

Special cost-effective Multi-User Licenses are available for purchase directly from CTC. For information, call our Multi-User License contract administrator at (800) 336-3320.



1040 Marina Village Parkway  
Alameda, CA 94501 (415) 521-5900  
(800) 336-3320 FAX: (415) 521-0369

# What does Compaq give 386 users who expect the moon?



Giving demanding users the best PC possible is a tradition at Compaq. A tradition we upheld when we introduced the world's first PCs based on Intel's 386 and 386SX microprocessors. And a tradition that continues in our comprehensive line of desktop PCs.

Within this line you'll find six different levels of 386 performance and affordability. And a PC designed to give you the perfect balance of features and power. You'll find the reliability and compatibility you've come to expect from Compaq. Plus the flexibility to choose from a wide array of optional features.

You'll also find an Authorized COMPAQ Computer Dealer, who's trained to match the right peripherals and software with the right PC. And to tailor a solution to your exact needs.

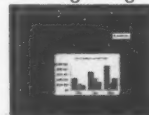
All at prices that are more competitive than ever.

Come look at the COMPAQ DESKPRO 386N Personal Computer, for example. This machine

is a full-function PC with breakthrough features for networked environments. As a stand-alone PC, its 16-MHz 386SX microprocessor handles all of the general business applications our other 386SX-based PCs run. With so many integrated features, you can take care of your expansion needs using only two slots.

And it comes with a host of unique network features like multilevel security, making it the best full-function personal computer for connected environments. All of this fits neatly into a space-saving design.

The COMPAQ DESKPRO 386s Personal Computer is also designed to handle general business applications. Its 16-MHz 386SX microprocessor gives you exceptional 386 performance. And its 32-bit architecture lets you run today's popular business software. It also offers the flexibility to run tomorrow's advanced business software.



# The stars.



Project managers and other general business users will find everything they need to manage databases and speed through complex spreadsheets in the COMPAQ DESKPRO 386s/20 Personal Computer. It delivers the

applications. It's the perfect personal computer for people who are serious number crunchers, administrators who manage massive loads of information as well as engineers who work on generating complex

maximum in 20-MHz 386SX performance and a broad range of integrated features.

The COMPAQ DESKPRO 386/20e Personal Computer is for experienced users. It's perfect for demanding applications like presentation graphics. And it's loaded with high-performance features like an advanced cache architecture. So it runs up to 50% faster than other 20-MHz, non-cached 386-based PCs.

For users doing similar jobs, but with more stringent performance needs, we offer the COMPAQ DESKPRO 386/25e Personal Computer. Its 25-MHz 32-bit performance lets you fly through financial analysis as well as other demanding

two-dimensional CAD drawings.

At the most demanding level of 386 computing are the power users who do graphic-intensive applications like 3-D CAD drawings and other performance-intensive applications. These people need the kind of performance that the COMPAQ DESKPRO 386/33L Personal Computer delivers. It combines the fastest 386 microprocessor with high-performance innovations. And it lets you easily upgrade to the power of 486 performance.

If you're looking for the 386 desktop PC that simply works better for whatever you do, call 1-800-231-0900, Operator 129. In Canada, call 1-800-263-5868, Operator 129.

**COMPAQ**

It simply works better.



# Hybrid

FROM PAGE 87

er transitioning low-traffic segments of their T1 networks to ISDN to gain the economic advantages the switched service can provide.

A major reason the hybrid approach is attractive from a cost standpoint is that on dedicated T1 network segments configured to handle peak traffic periods, there could be chunks of prepaid bandwidth sitting idle for several hours a day — adding up to megadollars down the drain. ISDN, on the other hand, can replace those segments with switched bandwidth that is paid for only when used.

T1 suppliers are putting artillery in place for the looming hybrid market. During the past year, most have started shipping or have announced intentions to ship stand-alone T1-to-ISDN gateways or T1 multiplexers with integrated ISDN interfaces.

On the ISDN side, start-up Ascend Communications, Inc. in San Francisco said it will today announce The Pipeline, a stand-alone, modular device that allows host computers and local-area networks to use ISDN Basic

Rate Interface, Primary Rate Interface or T1 access to get from the customer's premises to a carrier's point of presence.

User companies are primarily evaluating migration to the ISDN's Primary Rate Interface, which has equivalent bandwidth to a T1 circuit (1.54M bit/sec.) and certain advantages.

Primary Rate Interface's attractive features include bandwidth-on-demand, which is made possible by ISDN's dedicated signaling — or D — channel.

"The advantage to ISDN," says H. Paris Burstyn, vice-president of telecommunications at Business Research Group in Newton, Mass., "is that the D channel allows you to tell the network what capacity you need on the fly and dial it up."

The hybrid approach has also been cited by users and analysts as particularly cost-effective for network segments that handle bursts of traffic — common to inter-LAN activity — rather than a steady data flow. It is also an alternative for disaster backup and full-motion videoconferencing applications, for which users can dial up 384K bit/sec. of bandwidth on demand.

Bunge Australia, a worldwide food and textiles conglomerate,

has an advantage over U.S. companies in its transition efforts because the country's telecommunications authority made Primary Rate Interface available last year to the Australian business community. While ISDN is perceived as less widespread in the U.S., there will be 344 U.S. cities served by AT&T's Primary Rate Interface service by the end of the year, which is about the same number of AT&T T1 points-of-presence, says AT&T spokeswoman Claire Diamond.

Gunasekera says that his company's transition to Primary Rate Interface included only the \$1.8 million (Australian) cost of the ISDN-capable T1 multiplexers, which are being provided by General Datacomm, Inc.

"We expect a payback on our investment in 17 or 18 months," Gunasekera says. He acknowledges, however, that Bunge did not previously own any private T1 multiplexing equipment — it was provided by the Australian telecommunications authority — so he had no equipment investment to swap out.

While ISDN enables companies to pay for switched bandwidth only when they use it, AT&T's and MCI Communications Corp.'s Primary Rate Interface tariffs do require a \$3,000 installation charge per Primary Rate Interface connection plus a \$400 monthly recurring charge and usage fees. U.S. Sprint Communications Co.'s installation fee is \$2,000 plus a \$300 monthly charge.

## Master of disaster

The switched nature of ISDN makes the technology particularly economical for disaster recovery because bandwidth doesn't have to be dedicated — and paid for — at all times just to protect against potential circuit failures.

Fazil Bhimani, manager of network services at Heller Financial, Inc. in Chicago, cites three reasons why he is about to start testing Primary Rate Interface on segments of his fractional T1 network. In addition to cost-effective full-motion video applications that he anticipates arising at his company, he says he plans to save money by "not having to buy a lot of modems for dial backup" and by combining the access for fractional T1 and switched digital service on the same line.

Hybrid T1/ISDN customers can save on access charges because when they subscribe to a carrier's Primary Rate Interface ISDN service, they buy a T1 trunk to one of their carrier's central offices, along with access to an ISDN D channel. The D channel allows the customer to access the carrier's point-of-presence — on one trunk — and then access any of a number of switched digital services offered by the carrier. Examples of these services are AT&T's Megacom

800 or U.S. Sprint Communications Co.'s Sprintnet Packet Data Network.

By eliminating the need for a separate access trunk for each service, users could save thousands of dollars a month, according to Bob Kinderlehrer, senior product marketing manager at Timeplex, Inc. in Woodcliff Lake, N.J. Last month, Timeplex, a pioneer in the T1 market, announced the ISDN Gateway Server, a \$12,500 to \$24,000 stand-alone device scheduled to ship next month, which interfaces the company's Link+ family of T1 multiplexers onto a Primary Rate Interface line.

## Almost there

Infotron Systems Corp., another global T1 multiplexer vendor, says it is in the midst of finishing up its "next-generation" product, which will include a Primary Rate Interface module. Louis Stimp, manager of product marketing, expects 3,000 to 5,000 of the 30,000 existing T1 lines to make the transition to ISDN during the next two to three years.

Business Research Group recently conducted a survey of more than 200 large companies about T1-to-ISDN migration plans. According to Burstyn, 10% of the respondents had already done some T1-to-ISDN transitioning, and another 17% said they plan to.

The hybrid T1/ISDN network scenario, though, is not yet barrier-free. "It's pretty simple if you have the service from a single carrier," Bhimani notes, "but you run into a problem if

you use multiple carriers, because they haven't yet worked out Signaling System No. 7," a standard that allows carriers' central offices to communicate.

Timeplex acknowledges that its customers have to determine up front which carrier will provide ISDN service in order to specify the appropriate interface board to connect to AT&T's 4ESS or Northern Telecom, Inc.'s DMS-250 switch to be bundled into the gateway. In addition, Timeplex's Kinderlehrer says, in a hybrid network, users would need two separate network management systems.

Gunasekera adds that global companies will have to seek approval from the government of the country in which they will run their T1/ISDN-capable products, which took a week in Australia when he purchased his General Datacomm equipment.

Kevin Shannon, telecommunications manager at General Electric Corp. in Syracuse, N.Y., says he would "be crazy not to consider transitioning from dedicated T1 to switched ISDN," but that he "wouldn't jump into the pool with all my clothes on." He expressed a concern that there are not enough tools yet available for adequately managing the hybrid network.

"I'd have to figure the cost differentials between Primary Rate Interface vs. straight T1 and find out whether the AT&T points of presence I'd need to connect to offer a [Primary Rate Interface-capable] Class 4 switch," he adds. "The question of the islands of ISDN is still a valid one."

# Basic-rate barrier

One barrier to a move from T1 to Integrated Services Digital Network (ISDN), users say, is the lack of availability of Basic Rate Interface ISDN services. Basic Rate Interface services offer 144K bit/sec. of bandwidth and are being eked out by the local telephone companies in a much less timely manner than the industry had hoped years ago when the technology was introduced.

According to Steve Sazegari, an analyst at Dataquest, Inc. in San Jose, Calif., there are no T1-to-Basic Rate Interface interfaces commercially available yet, though support for Basic Rate Interface is "in the future" in Timeplex, Inc.'s recently released ISDN Gateway Server, the company said.

In addition, Pacific Bell reportedly has been allowing customers to use its Centrex Basic Rate Interface service as a connection to T1 services such as AT&T's Accunet. Facsimile machine manufacturer Ricoh Corp. became the first customer to use Pacific Bell's Basic Rate Interface on-demand dial-up links to Accunet, and the company now uses such connections to transmit Group IV faxes among its U.S. sites and overseas to French and Japanese ISDN networks, according to John Zebrowski, sales support engineer.

Ricoh is also using two amalgamated 56K bit/sec. links to simultaneously support videoconferencing and document exchange.

Using ISDN on the local loop provides Ricoh with major cost savings over direct leased-line links to Accunet, Zebrowski says, even though "end-to-end ISDN" is not yet possible. A dial-up ISDN line lets Ricoh send Group IV faxes for 26 cents per minute — about the same cost as a voice call, he adds.

In Australia, Basic Rate Interface service is available countrywide, according to Ramsay Gunasekera, group business systems manager with Bunge Australia Proprietary Ltd. Gunasekera says he just completed successful testing of the service for a video application with a Bunge site in the UK.

Tom O'Sullivan, manager of network design and development at the Los Angeles office of Kaiser Permanente, a health maintenance organization, runs a fractional Infotron Systems Corp. T1 network spanning seven counties in Southern California and is eyeing a hybrid T1/Basic Rate Interface for future "occasional" data transmission applications, such as linking doctors to medical centers and home health-care applications.

JOANIE WEXLER and ELISABETH HORWITT

# HP X.500 product draws fire

BY J. A. SAVAGE  
CW STAFF

Despite the promise that the announcement carries and Hewlett-Packard Co.'s usual conservatism in having a complete product before release, there are doubts in the industry about HP's recent release of an X.500 network directory product. Other companies have announced products but have yet to ship them, and the X.500 standard is not yet complete.

"It's one of those announcements of a product before its time," said Steve Wendler, vice-president of Gartner Group, Inc. in Stamford, Conn. "It's vaporware. They do have code, but it's not industrial-strength code."

Gordon Preston, electronic mail manager at Du Pont Co., has been testing HP's X.500 product. "It's very, very new," he said. "There are still a lot of issues to resolve such as security and user-friendliness. There may be several hundred bytes of information on an address — that's absolutely not user-friendly." He said that an effective product is several years away.

Backtracking from the official announcement, HP Open Systems Interface marketing program manager Michael Johansson said the company was only shipping "core functionality" of the product to a group of fewer than 20 customers.

With messaging systems multiplying in large firms, directory and addressing assistance, which could be provided by products using X.500, is increasing in importance. "We recently conducted a straw poll and found that directory and addressing, as a specific issue, was mentioned frequently as [internally] important to corporations," said Walter Ulrich, a management consultant at Arthur D. Little, Inc. in Los Angeles.

Johansson argued, however, that the standards have settled enough to issue products. "Since it reached the Draft International Standards stage, we are confident that [the final standard] will not be much different."

As the first major host vendor with such a product on the market, HP has not yet tested X.500 for interoperability with other firms' products, Johansson said.





# If you're ready to replace your 1/2" reel to reel tape drives, turn the page.

Don't get confused. We're not giving up on 1/2" reel drives.

On the contrary. Our new PE (top) and GCR tape drives are the best values for your interchange needs.

Both are advanced designs that include an embedded SCSI interface, fewer moving parts and increased cache memory. Making them almost

three times more reliable than ever before. Consider also that we've installed 260,000 tape drives in the last 22 years. Reasons enough to stick with your 1/2" media for many years to come.

But we didn't stop there.

As you'll soon discover, we've developed the world's smallest and most

economical tape drive in 3480 compatible format—the exciting, new PC to mainframe interchange standard.

So, for the best 1/2" tape drives of the 90s, please call 1-800-4CIPHER in the USA, or 011-44-734-775757 in Europe.

Otherwise, turn the page.



The choice of the world's leading computer companies.

# Integrated mail package lightens traveler's load

BY JOANIE M. WEXLER  
CWI STAFF

American Progressive Corp. originally purchased its Voxlink Corp. Voice Server because the firm's president found it unwieldy to lug around a portable computer. Now, with the product's recently added facsimile mail capability, the firm anticipates savings of 50% on its monthly fax charges and is also designing what it hopes will be a lucrative application around the package.

American Progressive is a health insurance underwriter that recently purchased the fax capability for Voice Server,

which allows users to check voice, electronic and fax mailboxes with one phone call. The product integrates with several electronic mail packages for MS-DOS local-area networks, such as those from CC:Mail, Inc. and Da Vinci Systems. American Progressive runs the Postmaster E-mail package from Modem Controls, Inc. over three Novell, Inc. Netware LANs.

Voxlink's original intent was to relieve the business traveler of having to carry a portable computer to access electronic mailboxes from the road. When a traveler punches in an identification number from a Touch-Tone phone, Voice Server will

check that individual's voice, electronic and fax mailboxes. If an E-mail message exists, the system will either convert the text to synthesized voice and read the message — much more quickly than a human, said American Progressive President Ernest Clevenger — or redirect it to a fax number designated by the caller.

Voice Server will also redirect mail downloaded from a fax server to another fax machine. "All 80 users on our three LANs now have the capability of rerouting text to fax," Clevenger said. "This is handy for producing quotes for global clients in that our underwriters don't all have to produce a hard copy and hand it to

someone standing at the fax machine."

Before Voxlink added the fax-mail capability to Voice Server, American Progressive used Compuserve's fax service, which Clevenger said cost between \$3,000 and \$4,000 a month. "We hope to cut that expenditure in half," he said.

## Digital talk

The firm will soon conduct a beta test of a Voice Server application it is developing with Voxlink and IBM. The application will allow callers to enter a password and learn the status of their claims or quotes from database text converted into digitized voice, Clevenger said, adding that 10 to 15 customers should be using the application in early 1991.

"Service is the only edge we can offer, because we're small," he said. "Many people are not computer-literate. We're looking at ways to come to the customer's level, and that's the telephone."

Clevenger said his company has also teamed up with Voxlink and IBM to tweak the customer service application and market it to other industries.

"For example, truck drivers could call a clearinghouse and get a voice-synthesized message of the nearest load to pick up for a return trip," he explained.

IBM got in on the act when Lloyds of London, an American Progressive client, requested the underwriter to route information across IBM's Information Network. American Progressive will receive royalties from Voxlink on application sales, and Clevenger said IBM will likely receive its compensation through business in its Information Network. "It isn't clear yet whether any royalties will be paid to IBM," he said.



Now you can escape the confines of your system and never get caught.

When an organization runs off in every direction, it's hard for its systems to keep up—especially since IBM channels can't reach beyond a few hundred feet.

Network Systems' channel extension family overcomes the physical limits of IBM channels. It helps you arrange systems according to business needs, not



technical specs. So you can make channel connections to all kinds of peripherals, computers, and networks almost anywhere with no performance loss.

Our channel extension family is big enough to let you start at any level and grow from there. And its design is open-ended, so you won't get trapped by old technology in the future.

Unleash the full potential of your systems. Call us at 1-800-338-0122.



**Network Systems.**

© 1990 Network Systems Corporation

## BIT BLAST

# EDS moves into video

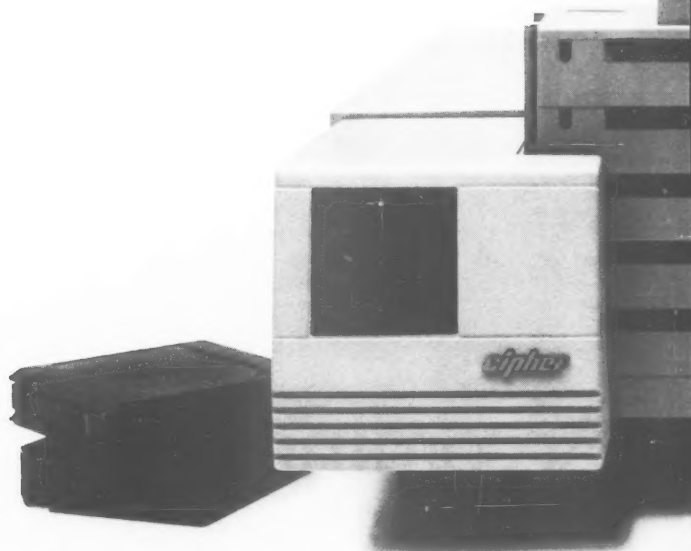
Electronic Data Systems Corp. (EDS) and Compression Labs, Inc. (CLI) have said they will jointly develop and market video communications products that will incorporate CLI's compressed digital video technology for interactive applications and EDS's infrastructure and communications network.

Andersen Consulting has reportedly signed an agreement with Vicorp Interactive Systems, Inc. under which the systems integrator will resell Vicorp's Betex software, which integrates voice, data and image services.

Development of software to integrate AT&T Tridom's very small aperture terminals with Innovative Electronics' Netmaster System — an automated price verification and inventory-checking system — is reportedly underway by the two companies, which said they plan to jointly market their integrated products and services to the retail industry.

Easel Corp. said it is offering Annatek Systems, Inc.'s Network Navigator software — which automates the management of software distribution, data distribution and collection, configuration management of personal computers and remote support — with Easel's graphical application development environment.

# If you're not, go back a page.



Introducing Tapexpress™, the world's smallest and most affordable 3480 compatible tape drive. As you know, 3480 technology is the interchange standard for mainframes. With Tapexpress™, this format will also become the standard that links mainframes to midranges and PCs.

Tapexpress™ has the fastest backup and restore of any desktop tape drive

available today, thanks to its 1.5 MB per second transfer rate and 2.2 gigabyte automatic cartridge loader. But what's even more remarkable, we've made all of this fit into a space that's about the size of a dot-matrix printer.

And when you consider the storage benefits, capacity and the fact that operators will no longer idly wait to

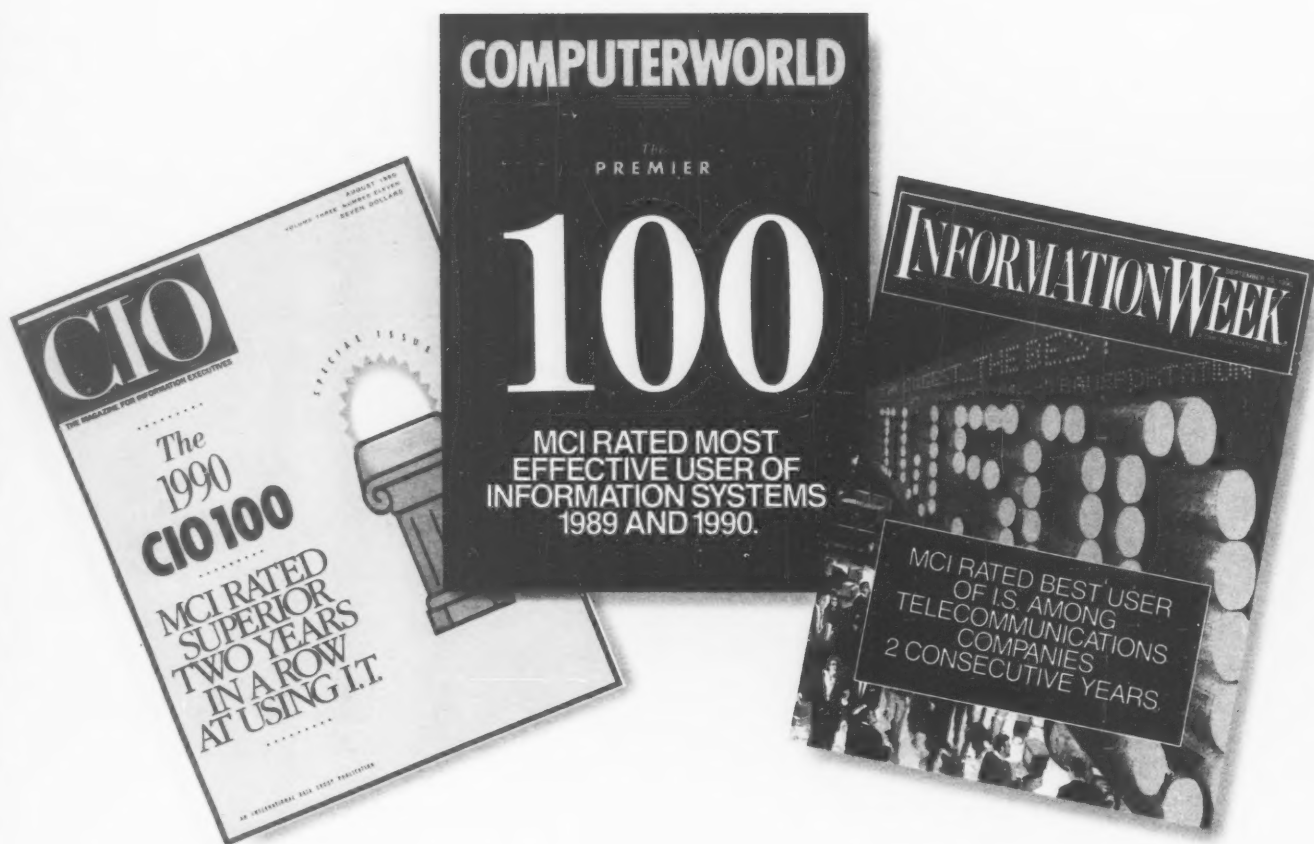
change tapes, the reasons to switch to this new 3480 technology become even more compelling.

If you have any questions, call 1-800-4CIPHER in the USA, or, in Europe, 011-44-734-775757. Or stop by booth #1816 at Comdex.

If you're unsure, you can always go back a page.



The choice of the world's leading computer companies.



## According To These Industry Bibles, We Practice What We Preach.

Once again, three of the most prestigious magazines in the information technology industry are singing MCI's praises.

*Computerworld* says we deploy computer power where and when it's needed to meet specific customer demands faster than anyone else in the country. And that MCI® is among the best in the world when it comes to applying technology to solve customer problems. *CIO* and *InformationWeek* agree that we use I.T. better than any other long distance company.

All of this may sound like good news for us, but it's really a testament that as an MCI customer you're assured the same expertise and state-of-the-art advances that have made us number one.

For more information on how to have the most innovative and efficient communications service possible, call MCI at 1-800-888-0800. Because next year there's only one business we'd like to see get more praise than ours. And that's yours.

**MCI®**  
Let us show you.®



# Gearing up for communications

BY ELISABETH HORWITT  
CW STAFF

Automobile dealers that need a more flexible, cost-effective way to keep in touch with their manufacturers will soon have help from a partnership made up of Scientific-Atlanta, Inc. and V-Crest Systems, Inc., a wholly owned subsidiary of Volkswagen of America, Inc.

The two firms recently announced they will provide turnkey communications systems that mesh Scientific-Atlanta's very small-aperture terminal (VSAT) networking service, SkylinX.25, and V-Crest's expertise at developing auto dealership management applications and services.

At the same time, the firms announced a contract valued at \$12 million under which Scientific-Atlanta will design, install and service a VSAT network for V-

will be required for all three franchise units, V-Crest said.

The alliance between V-Crest and Scientific-Atlanta will concentrate on providing import car dealers with the same level of interactive, satellite-based communications that Volkswagen

and major U.S. manufacturers have been setting up for their own dealers, Smith said. Such links are growing important to dealers as a way to support key applications such as electronic distribution of parts catalogs, electronic-mail exchange and

video for service training, he added.

To communicate effectively with each supplier, dealers typically have to set up separate terrestrial links and communications systems, because each manufacturer may use a different set of protocols, Smith said.

In contrast, a dealership can use a single VSAT to communicate with all of its manufacturers

by transmitting to the Scientific-Atlanta hub, which then routes transmissions to the correct supplier site, Smith said. V-crest and Scientific-Atlanta will sell a digital processing unit that can handle asynchronous, IBM's Synchronous Data Link Control and X.25 transmissions, translating whatever format the dealer uses into a given supplier's format, he added.

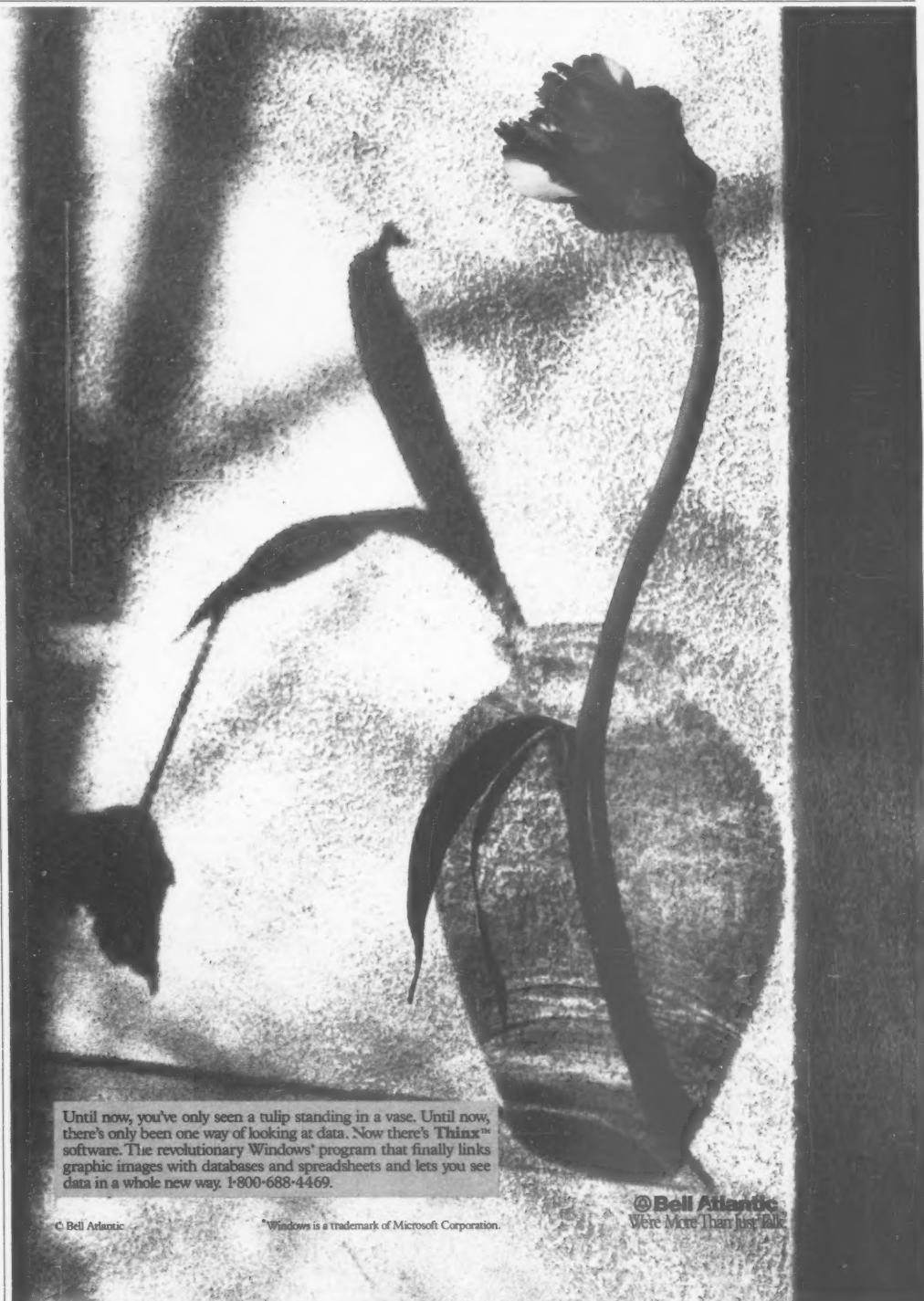
**T**HE VSAT network will link as many as 835 Volkswagen and Audi dealers across the U.S. to V-Crest's headquarters.

Crest. Based on the Atlanta, Ga.-based satellite network vendor's Skylin X.25 VSAT offering, the network will link as many as 835 Volkswagen and Audi dealers across the U.S. to V-Crest's headquarters, the two firms said.

V-Crest is in the process of migrating to Skylin X.25 from a terrestrial network of 4.8K bit/sec. leased multidrop lines from AT&T, said Jim Smith, research and development manager at V-Crest. Linking to dealers was getting too costly, "and we couldn't deploy new dealership links fast enough" with the terrestrial network, he added. V-Crest expects to have completed the migration by the first quarter of next year.

Volkswagen's VSAT-based dealer network will support 56K bit/sec. in both directions and carry video and data, Smith said. An important reliability feature is the system's ability to automatically switch transmissions from one transponder circuit to another when there is a line failure, he added.

V-Crest has already signed a contract with Porsche Cars North America, Inc. to provide communications between the importer and its dealers over the same network that Volkswagen and Audi dealerships use. Because nearly 80% of Porsche's dealers reside at the same location as a Volkswagen or Audi franchise, only one satellite dish



Until now, you've only seen a tulip standing in a vase. Until now, there's only been one way of looking at data. Now there's **ThinX™** software. The revolutionary Windows® program that finally links graphic images with databases and spreadsheets and lets you see data in a whole new way. 1-800-688-4469.

© Bell Atlantic

\*Windows is a trademark of Microsoft Corporation.

**© Bell Atlantic**  
We're More Than Just Talk

# ANSI pursues 'FDDI lite'

BY JOANIE M. WEXLER  
CW STAFF

FORT LAUDERDALE, Fla. — The much-banded-about issue of rigging up less costly Fiber Distributed Data Interface (FDDI) alternatives became slightly less amorphous after the American National Standards Institute's (ANSI) FDDI committee meeting earlier this month.

Two ad hoc committees — one exploring the viability of running FDDI's 100M bit/sec. data rates over twisted-pair wiring and the other examining less costly ways to build fiber components — approved proposals targeted to receive ANSI's final nod in December 1992.

The existing FDDI standard specifies a token-ring local-area network that communicates over glass fiber-optic cabling, a highly reliable medium that is completely resistant to electromagnetic interference and offers bandwidth capacity into the gigabits per second. However, the fiber-optic components for FDDI are still expensive, and glass fiber is difficult — and thus costly — to install.

Given the long lead time required by new standards activity, the threat of lower cost alternatives to achieving FDDI's high communications speeds could serve mainly as an invisible hand of looming competition and push FDDI vendors to reduce their prices in a more timely manner. While the price of fiber components and chip sets to vendors has dropped by nearly 50% over the last year, the cost per seat still averages about \$11,000 to the user.

"Fiber-optic vendors are seeing pres-

sure from the copper advocates and are realizing that they won't recover their engineering costs on their first 10,000 units sold," said Ron Perloff, president of Xint Designs, Inc., an FDDI vendor in San Diego. "They're going to have to lower their prices to salvage the market."

From the twisted-pair perspective, the issue revolves around whether to develop technologies for the high speeds over unshielded twisted-pair in addition to shielded twisted-pair, said Floyd Ross, vice-chairman of the FDDI ANSI committee.

One reported problem is that few users trying to capitalize on the existing unshielded copper in their walls probably have a high enough grade of wire to reliably support the 100M bit/sec. data rates, even over the proposed reduced distances between nodes — from 2 km over glass to 100 meters over copper.

Also, while writing specifications for IBM's Type 1 shielded twisted-pair would reportedly be fairly simple, there are significantly fewer numbers of users who have that type of wiring installed and could take advantage of the technology. CIMA Corp., a market research and consulting firm in Voorhees, N.J., estimated that 23% of large companies have shielded wire installed for LAN use, compared with 77% running unshielded wire.

The low-cost fiber ad hoc committee decided that any new standard — such as one specifying a plastic fiber medium — would be interoperable with the existing glass standard.

A few dissenters pushed for a new stand-alone standard, which the majority of the committee felt would only serve to



## Beating the bottlenecks

Once users figure out a way to afford FDDI's 100M bit/sec. speeds, they may discover they've merged onto an eight-lane highway in a Model T.

Most of today's transport-layer communications protocols are too slow to capitalize on FDDI's high data rates. FDDI specifies only the first two layers of the Open Systems Interconnect model — the physical and data link layers.

The transport- and network-layer protocols running over FDDI, such as the widely used Transmission Control Protocol/Internet Protocol (TCP/IP), run much slower than 100M bit/sec., shifting the traffic bottleneck from the network to the workstation.

TCP/IP, for example, was originally designed for use in unreliable environments and thus carries with it a lot of overhead that slows it down — overhead that is not needed by FDDI, which runs over the highly reliable fiber medium.

In today's neophyte FDDI environ-

ment, users generally use FDDI as a backbone to interconnect LANs, which may cumulatively make full use of the 100M bit/sec. speeds.

But for users who soon wish to use the full capacity of FDDI on a peer-to-peer LAN — such as Case Western Reserve University in Cleveland, which intends to interconnect individual FDDI LANs over a Sonet backbone — communications protocols that run over FDDI will have to be stepped up.

Work is under way. Protocol Engines, Inc. in Santa Barbara, Calif., has been working on XTP, a high-performance transport-layer protocol on the table for standardization at ANSI. According to Protocol Engines President Larry Green, XTP runs 15% faster than TCP/IP when implemented in software and will run "orders of magnitude faster when put in silicon," an event slated for May 1991. The protocol exists in some software implementations today.

JOANIE M. WEXLER

fragment the FDDI market, keeping volume down and prices elevated.

Since the efforts of both ad hoc committees include reducing FDDI's inter-nodal requirements to 100 meters, "you can relax the transmitting power specification and the receiver sensitivity, so it would be easier and cheaper to build parts," explained Bruce McClure, who chaired the low-cost fiber group and is chief technical officer at Synmetrics, Inc., in North Billerica, Mass.

The committee's intent, McClure said, is to retain FDDI's high performance and

low error rate over shorter distances. The shorter distance would make the alternatives more suited for to-the-desktop applications than for use as a backbone.

According to Perloff, applications that would be unsuitable for the 100-meter alternatives would be in environment-sensitive areas, such as those in the military and financial industries. He said that the current standard specifies one undetected error rate in 20 years and that moving to a copper link with a significantly higher bit error rate could "ruin a launch or add or subtract millions to a bank account."

## Fritz

CONTINUED FROM PAGE 87

has remained "out of sight, out of mind" — that is, until the previous lack of management catches up with the LAN. Then the network begins to collapse under the load of increased traffic, heavy broadcast traffic, inadvertently duplicated network addresses and excessive packet errors.

Given the high bandwidth provided by today's LAN media, early problems can easily go unnoticed. When the LAN is small, the extra bandwidth covers up most problems. However, the problems increase exponentially as the LAN grows and becomes interconnected with other networks. The resulting sequence of events is predictable. At first, administrators tend to regard problems as a "fluke." However, the house comes down before long, and LAN users demand a cure. Once the smoke settles, approval finally comes for network management tools to prevent future problems.

LAN operators alone are not to blame for this state of affairs. Corporate administrators are often unwilling to commit up-front dollars for LAN management. This kind of thinking must change.

Administrators and LAN operators must realize that a LAN that is stable today may become a major problem tomorrow. Few LANs are static, remaining at the same size and power forever. LANs quickly evolve into metropolitan-area and even wide-area networks as bridges,

gateways and routers extend their range and interconnectivity.

To be fair, effective tools for dealing with network management have not always been easy to find. Fortunately, this now seems to be changing. Devices such as Network General's Sniffer and Expertdata's Vigil are available to monitor LAN performance.

There are a growing number of software tools available for network management. Some packages, such as Cabletron System's just-announced Spectrum, provide an early warning system for potential problems. Most importantly, the industry has begun to set a standard for network management. A developing protocol called Simple Network Management Protocol (SNMP) has garnered support from such well-known networking vendors as Novell, Vitalink and 3Com. The development and use of network management tools based on SNMP is critical.

Clearly, there is hope for effective network management tools on the horizon. However, such tools are of little value without the user community implementing them. It is now up to LAN operators, administrators and users to make LAN management a part of their design and day-to-day operations. Without effective network management, LAN chaos is guaranteed to follow.

Fritz is a data communications analyst at West Virginia University in Morgantown, W. Va.

## Unhelpful help line personnel

BY JIM NASH  
CW STAFF

User demand for local-area network service is not abating. An unpublished study of network administrators indicated that their frustration — particularly with telephone support on software problems — will only grow as networks multiply.

The study, to be published this fall by International Data Corp. in Framingham, Mass., indicates that telephone support for network software is the weakest link in the loose chain of network service.

IDC analyst Carol Watson said that in a study of 262 data communications managers, the most frequently cited source of dissatisfaction was the inability to get qualified help over the phone.

One indication of the increasing importance of LANs is the growing amount of money Watson said network administrators will spend on LAN hardware support versus wide-area network support. According to the report, service and support for LAN hardware equaled WAN support in 1989. But Watson predicted that by 1994, LANs will account for 71% of the estimated \$2.9 billion spent on networking hardware support.

Aimed at network vendors, the study indicated that LAN manufacturers looking for value-added points can benefit by devising efficient help services.

"That's definitely true," said Avo

Amirian, LAN specialist at City National Bank in Beverly Hills, Calif. Amirian said he recently tried to connect a Compaq Computer Corp. 386N diskless workstation to his Novell, Inc. Netware Version 2.15C network with an IBM Token-Ring adapter card. When he was unable to make the connection, he got a round of finger-pointing from all vendors involved.

"Everyone was giving me different answers," he said. "It was frustrating."

Watson said such experiences point to a common complaint among administrators: They do not usually find the most qualified person manning help lines.

Michael Sanchez, chairman of a 3Com Corp. users group called 3Group New Mexico, said 3Com phone assistants "are not always as responsive or attuned to what customers want."

Amirian said Novell's expensive help charges further aggravate users.

3Com offers a subscription service in which its technicians remotely enter a client's network to find flaws, Sanchez said, which only helps if the system is operational. Sanchez is manager of technical support at High-Tech Associates, Inc.

Looking at it from the vendor's perspective, Alice Bradie, an analyst at Hambrecht & Quist, Inc., said the need could be turned to profit: "I wouldn't call it a bonanza, but it's an opportunity" for third-party companies and vendors looking to stand out from their competition.

In designing the new  
386SX notebook,  
Epson engineers had to  
weigh a lot of options.



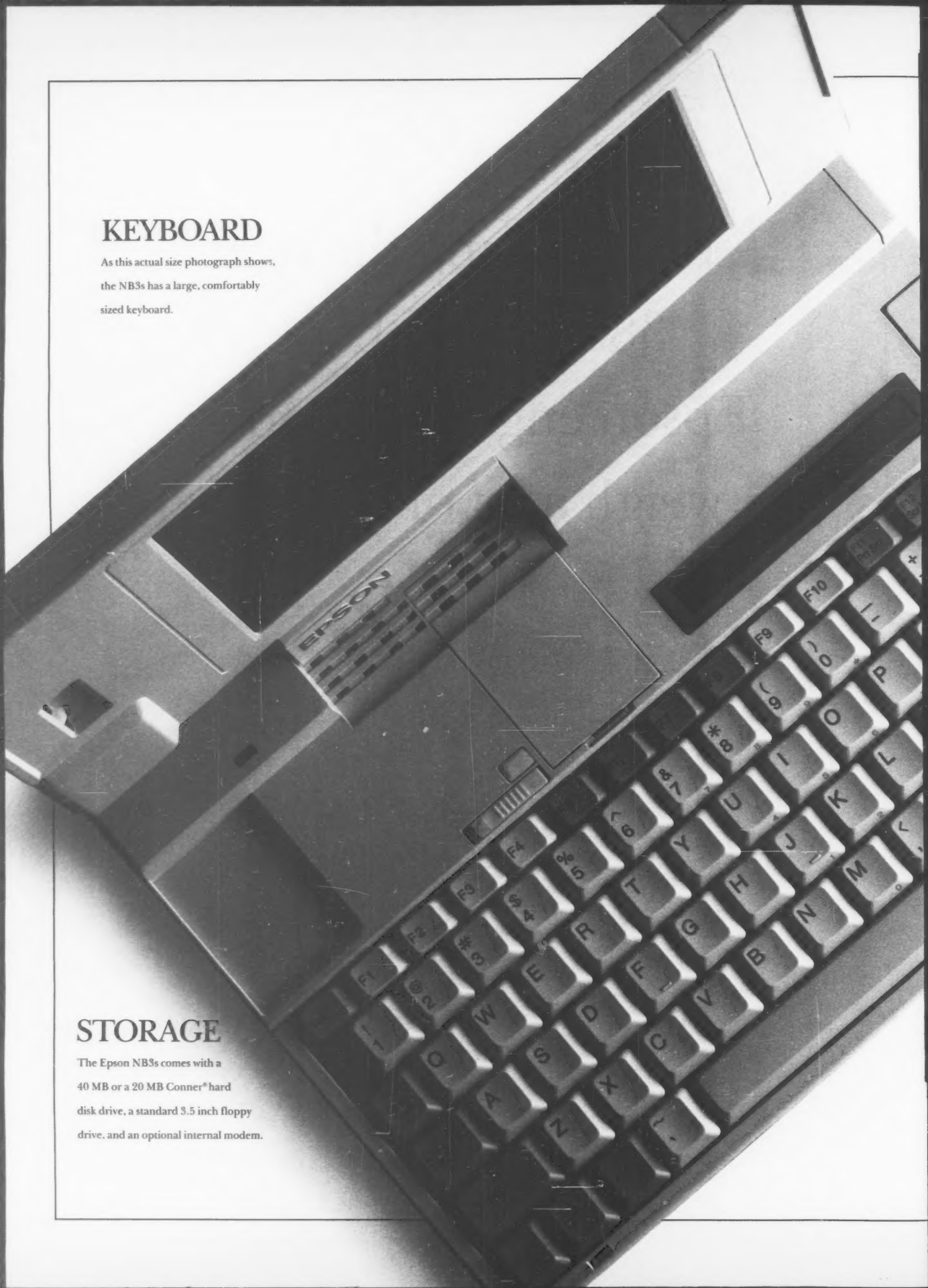


## KEYBOARD

As this actual size photograph shows, the NB3s has a large, comfortably sized keyboard.

## STORAGE

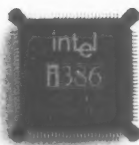
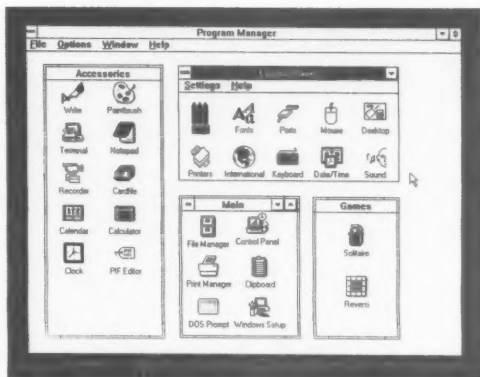
The Epson NB3s comes with a 40 MB or a 20 MB Conner® hard disk drive, a standard 3.5 inch floppy drive, and an optional internal modem.





## VGA

The large backlit, 640 x 480 resolution LCD screen includes 16 gray scales for sharp black-on-white VGA graphics.



386SX

Finally a notebook computer with the power and performance of a 386SX and up to 5 MB of RAM to run all of your most popular applications, including Windows™ 3.0. You can even install an optional math co-processor.

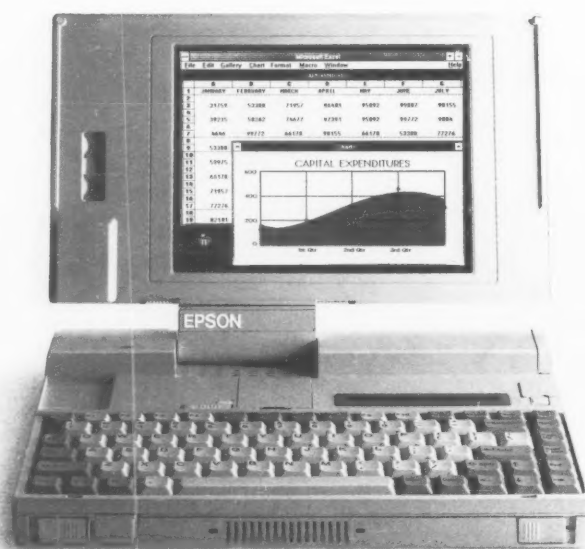
# Combined, they add up to 5.8 pounds.

In a world where PC users demand uncompromised performance from a portable computer, Epson® introduces a 5.8 pound engineering breakthrough that dispels the notion that less weight means less computer.

The product is the new Epson NB3s. The performance is that of a 386™SX desktop, with up to 5 MB of

RAM, a choice of a 40 MB or 20 MB hard drive, and VGA technology for sharp, legible graphics—all in an 8.4 x 11.8 x 1.7 inch computer.

That combination of power and portability makes the Epson NB3s the perfect computer for people who simply don't believe in compromise.



## Pick one up at COMDEX.

To see how light a 386SX notebook can be, you'll have to pick up an Epson NB3s. To see how fast and powerful it can be, you'll have to spend a few minutes working with this high performance notebook computer.

You can do both at COMDEX. The new Epson NB3s notebook computer will be on display in booth 1178 in the Las Vegas Convention Center's East Hall, so you can weigh all your options yourself. At the same booth, you can also see our entire new line of desktop computers and laser printers, including a new Postscript® model.

Engineered For The Way You Work.™

**EPSON**

# Tax collection warms up as Canada makes network plans

BY JIM NASH  
CW STAFF

OTTAWA — The good news in Canada is that work will soon start on one of that country's largest personal computer-based local-area networks. The bad news for some people is that the network will be used to speed collection of taxes.

3Com Corp. in Santa Clara, Calif., was awarded a contract recently to install its 3+Open network operating system and communications software in 54 tax-collection offices nationwide for Revenue Canada, a northern cousin to the U.S. Internal Revenue Service.

The sites must be linked by Jan. 31, 1991, to process anticipated new tax returns. As many as 200 more tax and customs sites could be networked during the next two years should the Canadian Parliament decide to do so.

A spokeswoman for 3Com Canada, Inc. said the initial contract is worth about \$3 million (Canadian) and will involve as many as 3,000 workstations. The spokeswoman said 3Com will install one network per day to meet the deadline.

Peter Hyne, president of Remuera Corp., an Ottawa network management service, said the project had been discussed for years. It was the prospect of asking the existing mainframe-only sys-

cantly more tax functions. Using the mainframe's and their own new databases, employees will be able to answer the public's questions about what will be taxable under the proposed law.

More importantly, regional offices will conduct more on-site audits of virtually all businesses. Without the new micro-to-mainframe system, Hyne said, the process of assigning, carrying out and filing audits would be paper-based. Office workers are expected to be issued laptops to

aid in the audits, he explained.

Local word processing and spreadsheet analysis will also be added to regional offices. Later, with the adoption of a CCITT X.500 directory service, the switch will mean greater information swapping capabilities through peer-to-peer operation for PC users.

3+Open's adherence to standards, Hyne explained, ultimately led to 3Com being chosen over Novell, Inc. and Banyan Systems, Inc. network operating systems. In addition, Hyne said, Novell is better with LANs than wide-area networks.

"Banyan was a good alternative, but the direction of the 3Com/IBM/Microsoft Corp. juggernaut in the next three to five years matches our course," Hyne said. He

was referring to the three firms' announced intention to standardize on X.400 and X.500 communications protocols.

3+Open also supports IBM's OS/2. "Our sense of the marketplace is that applications today and tomorrow will be written first for DOS and OS/2 and Novell's Netware later," Hyne said.

Beyond that, he said, 3Com can dynamically switch between Data Link Control, Xerox Network Services and Netbios protocols. Finally, Hyne explained, 3+Open frees more memory at the desktop. Compared with a fully configured Banyan Virtual Networking Software operating system, Hyne added, 3+Open left as much as 25K bytes more memory free.

## The direct route to reducing 3270 backlog.



Announcing the way to get the backlog off your desk once and for all.

dBASE DIRECT™ for 3270.

It allows dBASE® applications to communicate with mainframe applications through the familiar dBASE III PLUS® interface. So you can transparently transfer mainframe data in and out of your dBASE application. Create reports with mainframe data. Or automate mainframe access for greater user productivity.

Best of all, you can add a PC look and feel to your mainframe applications. So your dBASE users can do everything—including all their queries and customized reports—from the comfort of their own PCs.

Without any expensive mainframe upgrades. All you need is your 3270 emulation and HLLAPI, plus dBASE DIRECT for 3270 and dBASE III PLUS.

dBASE DIRECT works through your existing host security system to ensure data integrity. So it's completely safe and compatible within your mainframe environment.

Which means your mainframe can now be freed up for other tasks. And so can you.

Call 1-800-437-4329, ext. 1705, for more information, or for the name of the Ashton-Tate® dealer nearest you.

Ask about the dBASE DIRECT series for IBM minicomputers, too.

Do it now. Because any other route to your mainframe is just a detour.

**Ashton-Tate**

Trademarks: dBASE, dBASE III PLUS, dBASE DIRECT, Ashton-Tate, Ashton-Tate logo, Ashton-Tate Corp., International Business Machines Corporation. Other product or company names mentioned herein are for illustrative purposes only and may be trademarks of their respective companies. © 1990 Ashton-Tate Corporation. All rights reserved.

**W**ITHOUT greater automation, as many as five times more employees would be needed to perform processing and related tasks, Hyne explained.

tem to handle new expanded revenue-collecting duties as part of a proposed consumption tax that forced Canada's hand, Hyne said. Hyne was hired by Revenue Canada to act as director of the project.

The proposed tax demands a percentage of almost every sale with the exception of food and medicine and will be collected monthly, he said. Without greater automation, as many as five times more employees would be needed to perform processing and related tasks, Hyne said.

"Every government department is undergoing a fairly dramatic wave of new technology," he explained. For Revenue Canada, that means virtually abandoning its Hitachi Ltd. terminals and replacing most of them with 20-MHz Intel Corp. 80386SX- and 80386-based IBM clones. The PC contract has yet to be signed, he said.

All major data processing will be done on the Hitachi mainframe in Ottawa using Icon, Inc.'s IBM 3270 emulation product. The desktop machines "will virtually have a dedicated line via unshielded twisted pair to an IBM Token-Ring backbone to the Hitachi mainframe," Hyne said.

Depending on how heavy data flow is predicted at each office, either 4M bit/sec. or 4M/16M bit/sec. Token-Ring will be installed.

Regional offices will perform signifi-

# NEW PRODUCTS

## Local-area networking hardware

Everex Systems, Inc. has announced a line of token-ring network adapters that incorporate a bus master design and are equipped with a 128K-byte memory buffer to improve data transfer rates over local-area networks.

The Speedlink/TR adapters can be connected to IBM mainframes via LAN gateways and are available in 4M and 16M bit/sec. versions.

The products were designed for IBM Personal Computer ATs, Personal System/2s and compatibles and are scheduled to be released this month. Pricing ranges from \$645 to \$925.  
**Everex Systems**  
 48431 Milmont Drive  
 Fremont, Calif. 94538  
 (415) 498-1111

US Sage, Inc. has announced a 10M bit/sec. Ethernet adapter card designed to link IBM Personal System/1 computers in peer-to-peer or file server environments.

Mainlan for PS/1 is available as a complete starter pack that includes two 10M bit/sec. Ethernet cards and peer-to-peer operating system software. It also can be purchased as a separate card. The card uses 30K bytes of memory in conventional personal computer workstations, the vendor said.

The starter pack has a list price of \$499. Separate cards with Novell, Inc. network drivers are priced at \$199 each.  
**US Sage**  
 2005 Tree Fork Lane  
 Longwood, Fla. 32750  
 (407) 331-4400

Maco Networks, Inc. has announced an expansion product for its Lanframe server system.

Lanframe-4 Server can simultaneously support four separate dedicated local-area network processes from one rack-mount enclosure. It is separated into four equal computer segments with three slots, and each segment can be configured with an Intel Corp. 80286 processor configured with 1M byte of random-access memory, 250K bytes of static RAM, a built-in serial port and video support for monochrome and IBM Enhanced Graphics Adapter displays.

The product is priced at \$3,995, and additional 286 CPUs cost \$1,995 each.  
**Maco Networks**  
 802 E. Martintown Road  
 N. Augusta, S.C. 29841  
 (803) 278-7225

## Local-area networking software

Access Technology, Inc. has announced an enhanced version of its Forcomment Document Review Groupware, a software package designed to enable connected personal computer work groups and users of Digital Equipment Corp. VAX systems to increase the efficiency of their document review cycles.

The product allows selected reviewers across a network to share a common text document and add on-line comments and suggested revisions. VAX/VMS and All-In-1 editions are now available. Perpetual license fees range from \$375 for a Vax-

station to \$9,900 for a VAX 9000. All-In-1 editions cost \$450 for a Vaxstation and \$11,880 for a VAX 9000.

**Access Technology**  
 Two Natick Executive Park  
 Natick, Mass. 01760  
 (508) 655-9191

Xtree Co. has announced a network utility that can access local drives and file server volumes. Xtreenet 2.0 was designed for Novell, Inc. networks. It includes a graphical tree display of a disk's directory structure and a peer-to-peer capability that allows administrators to access any workstation on a network.

A Novell, Inc. Entry Level System (ELS) version is priced at \$249, and an advanced SFT/386 version is available for \$495. Registered Xtreenet 1.0 users can upgrade to the ELS or SFT/386 versions for \$95.

**Xtree**  
 4330 Santa Fe Road  
 San Luis Obispo, Calif. 93401  
 (805) 541-0604

United Information Technologies has announced a financial analysis application designed for local-area networks.

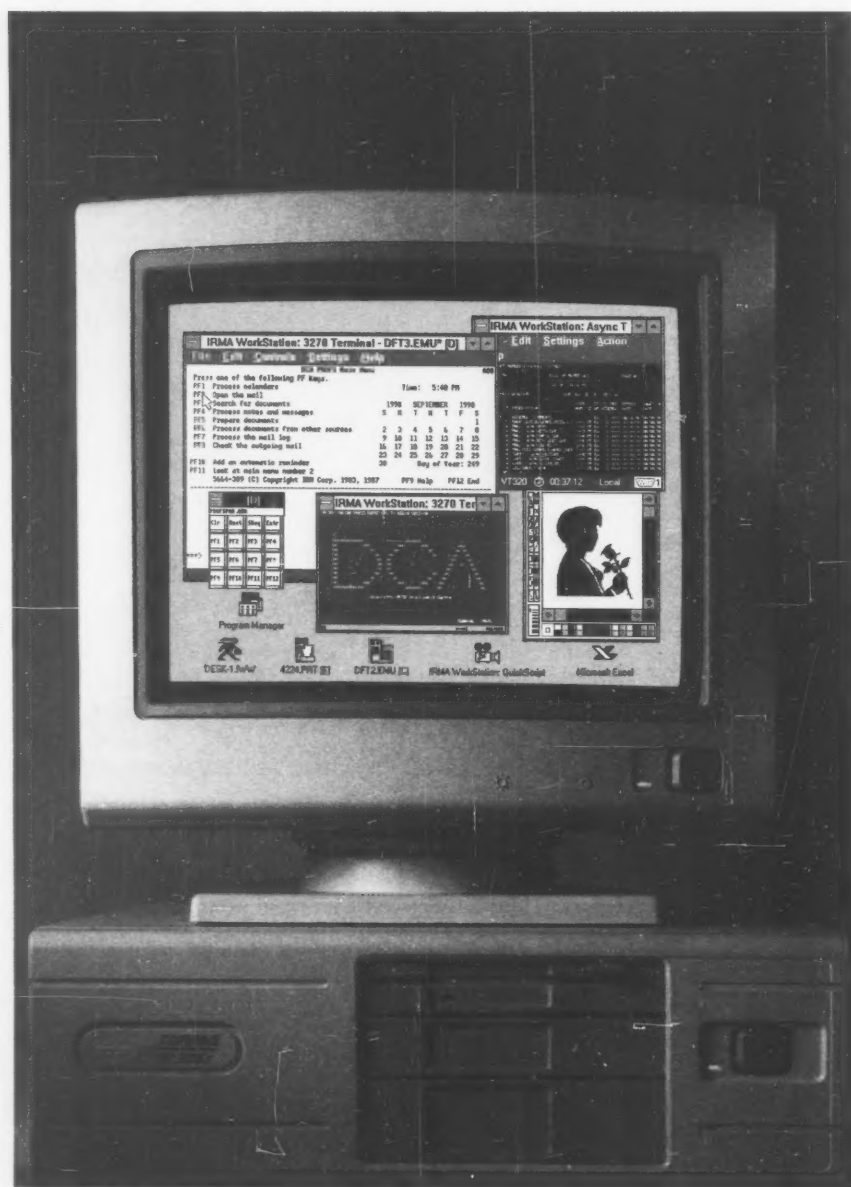
Planning and Analysis Groupware integrates menu-driven functionality with spreadsheet and multidimensional database capabilities. Because the product was written in Sinper Corp.'s TM/1 rela-

tional spreadsheet language, it provides users of TM/1 or Lotus Development Corp.'s 1-2-3 spreadsheet with networking capabilities, the vendor said.

The package is priced at \$3,495 per table server plus \$995 for each license.  
**United Information Technologies**  
 350 S. Main St.  
 Doylestown, Pa. 18901  
 (800) 237-5089

Persoft, Inc. has announced Intersect, a software bridge designed to connect and exchange data between Ethernet local-area networks.

The product operates at the Media Access Control level of the Open Systems Interconnect's Data Link Layer and complies with the IEEE's 802 standard. It



© 1990 Digital Communications Associates, Inc. All rights reserved. DCA is a registered trademark and IRMA, QuickScript, and Select are trademarks



uses the Spanning Tree Protocol to detect loops and dynamically locate network nodes.

Intersect runs over Ethernet, thin Ethernet and twisted-pair media connections. It requires personal computers running DOS Version 2.0 or higher. A unit with two Ethernet boards is priced at \$1,495.

**Persoft**  
**UW Research Park**  
**465 Science Drive**  
**Madison, Wis. 53711**  
**(608) 273-6000**

## Links

Til Systems, Inc. has announced Xpert/Office on the Go, a software package de-

signed to enable users of laptops and portable computers to access X.25 packet-switched networks via regular telephone lines.

The product comprises a personal computer-based X.25 half-card that integrates a V.22 bis modem, VT100 and Xpert file transfer emulation packages. It also incorporates X.32 technology that provides synchronous dial-up access to X.25 public and private packet-switched networks through standard telephone lines.

Xpert/Office on the Go is priced at \$1,350.  
**Til Systems**  
**225 Stedman St.**  
**Lowell, Mass. 01851**  
**(508) 970-1189**

Computer Network Technology Corp.'s Graphics Controller Interface allows multiple IBM 5088 or 6098 Graphics Channel Controllers to be attached to a single channel.

The product enables engineers at different locations to share access to common mainframe-based graphics design applications. It is offered free to customers who already have a sufficiently configured extended channel network. A hardware upgrade costs \$19,000. For customers who need to purchase an extended channel network, pricing begins at \$50,000 per network processor.

**Computer Network Technology**  
**5655 Wedgwood Road**  
**Maple Grove, Minn. 55369**  
**(612) 420-4466**

## Gateways/bridges/routers

Interlink Computer Sciences, Inc. has announced a product that allows users of IBM 3270 terminals to access non-IBM applications on Transmission Control Protocol/Internet Protocol (TCP/IP) networks with full-screen ASCII terminal emulation.

SNS/TCPVT Release 2.1 enables users to access applications on IBM systems and a TCP/IP network from a single terminal, the vendor said.

The product can be used on an IBM 3270 display system terminal or an IBM Personal Computer emulating a 3270. It is priced at \$10,950.

**Interlink**  
**47370 Fremont Blvd.**  
**Fremont, Calif. 94538**  
**(415) 657-9800**

Comware International has announced a gateway processor designed to support file transfer and terminal emulation for IBM midrange systems.

Comgate/FS links an IBM Application System/400, System/36 or System/38 with file servers residing on local- or wide-area networks. It uses IBM's LU6.2 protocol to allow partial or complete files to be transferred between IBM midrange hosts and network-based personal computers.

A basic system with as many as eight simultaneous PC connections and 20M bytes of file storage costs \$9,500; a 16-PC version sells for \$12,900.

**Comware**  
**P.O. Box 410**  
**451-K Second St.**  
**Solvang, Calif. 93464**  
**(805) 686-1262**

Rad Network Devices, Inc. has announced a stand-alone local token-ring bridge that features support for the impending source-routing transparent bridge standard.

The bridge filters and forwards source and transparent non-source-routing packets at maximum filtering rates of 120,000 frame/sec.

The bridge is available in two models, both of which are priced from \$3,995.

**Rad**  
**7711 Center Ave.**  
**Huntington Beach, Calif. 92647**  
**(714) 891-1964**

Microcom, Inc. has announced enhancements to its Microcom LAN Bridge (MLB) series of products.

The MLB/6000 for private-line connections and the MLB/5000 for dial-up links both feature data compression at a four-to-one ratio at up to T1 speeds. Both products also feature a local/remote bridge that obviates the need for separate units to be installed at sites that require both types of bridges.

The MLB/6500 bridge for X.25 links features a two-to-one data compression ratio.

Pricing ranges from \$4,999 to \$13,199 for the MLB/6000, from \$4,599 to \$7,599 for the MLB/5000 and from \$5,699 to \$8,499 for the MLB/6500. All pricing is based on type of configuration and hardware requirements.

**Microcom**  
**500 River Ridge Drive**  
**Norwood, Mass. 02062**  
**(617) 551-1000**

# For once, an announcement that will have businesspeople jumping into windows.

Until now, a lot of businesses have been hesitant to take the plunge into Windows. People have wondered, for instance, whether critical applications and viable communications would become available.

Well, if we may be so bold, we'd like to give you a little push - by introducing you to DCA's new IRMA™ WorkStation for Windows.

## A BREAKTHROUGH IN 3270 CONNECTIVITY: IRMA WORKSTATION FOR WINDOWS.

In the Windows 3.0 operating environment, only IRMA WorkStation for Windows gives you a choice of single (CUT) or multiple (DFT) sessions via coaxial cable, remote SDLC or token-ring connections, as well as asynchronous connections.

It also gives you 3270 terminal, 3270 printer and asynchronous terminal emulations, and an extensive range of 3270 and asynchronous file transfer protocols, including DCA's and IBM's. Both DCA and IBM hardware are supported, as well.

All of which means that you won't have to keep reinvesting in new software as your business's needs change.

In addition to its tremendous flexibility, IRMA WorkStation for Windows is quite sim-

ple to use, which helps boost productivity.

For instance, mainframe data can be directly embedded into a word processor or spreadsheet, using DCA's QuickScript™ and Windows Dynamic Data Exchange.

Only IRMA WorkStation for Windows supports APPC and supplies you with a user interface that conforms to IBM's SAA/CUA standard. It also provides you with a transparent migration path to OS/2®, using DCA/Micro-soft® Select™ Communications Workstation.

## TRADE UP TO THE MOST FEATURE-RICH SOLUTION FOR \$149.

Best of all, from now until March 29, 1991, we'll let you trade up from your old 3270 communications software - regardless of who you bought it from - for just \$149 per unit (the suggested retail price is \$495). For more information or to order, call 1-800-289-4DCA, ext. 66E (please have a photocopy of your master diskette on hand to fax in to DCA as proof of purchase).

It's easy. Just take a deep breath. Close your eyes, if you feel like it.

And jump.



© Digital Communications Associates, Inc. All other brand and product names are trademarks or registered trademarks of their respective owners.

# When you stack up the Microcom HDMS Dial-up Network Management System, you rack up the benefits.\*

## \* Easily Expandable.

HDMS's high density design makes it easy to handle growth in your network. You can grow from one to six chassis, with 32 modems per chassis, conserving critical computer-room space.

## \* High Speed, Error-free Transmission.

Dial-up speeds up to 38,400 bps are available, 100% error-free, keeping line charges at a minimum, and port availability at a maximum.

## \* Complete System Control.

Reports and monitors tell you who's using the network, when they're using it, and how well it's working — giving you complete control.

## \* Sophisticated Security.

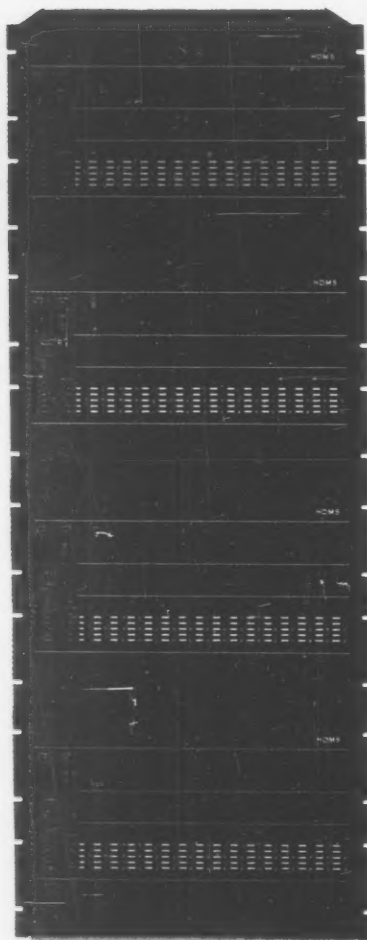
Passthrough, Variable/Fixed Call-back, and Microcom's exclusive MNP Password Connection Security™ help make your host virtually hacker-proof.

## \* Multiple Host Access.

Port grouping lets you assign multiple hosts to a single chassis or system, providing least-cost call routing, space/cost savings and control of user access.

## \* Compatible Modems.

Integrated V.32, V.29FT, V.27, V.22bis, V.22, Bell 212A and Bell 103 modems deliver up to MNP Class 9 with V.42 compatible error correction. Works with standard, popular modems.



### How To Manage Your Dial-up Networks

#### \* Free Report.

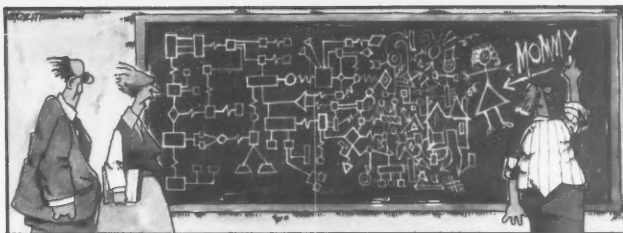
To find out how HDMS can help you manage your network more efficiently and effectively, just call for this free report, "How to Manage Your Dial-up Networks".

Call toll-free, 800-822-8224 today.

Workstation  
Connectivity  
Worldwide

**Microcom**

500 River Ridge Drive, Norwood, MA 02062 617-551-1000  
Telex 710-336-7802 MICROCOM NWD / USA FAX: 617-551-1006  
Worldwide Distribution — International FAX: 617-551-1007  
Toll Free 800-822-8224



"I THINK IT'S TIME HE GOT HIS OWN SUBSCRIPTION TO COMPUTERWORLD."

**YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$38.95\* per year — a savings of 62% off the single copy price.**

First Name \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_  
 Title \_\_\_\_\_ Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48 per year

\*U.S. Only. Canada \$110. Central/South America \$130. Europe \$195. All other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

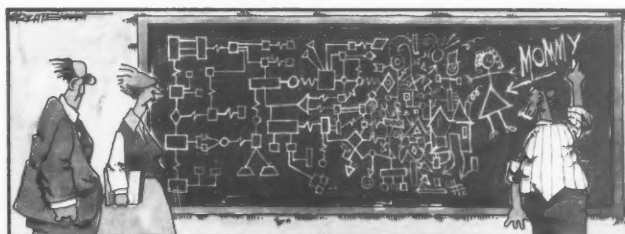
**COMPUTERWORLD**

E4044B-8

1. **BUSINESS/INDUSTRY** (Circle one)  
 10. Manufacturer (other than computer)  
 20. Finance/Insurance/Real Estate  
 30. Medicine/Law/Education  
 40. Wholesale/Retail/Trade  
 50. Business Service (except DP)  
 60. Government - State/Federal/Local  
 65. Communications Systems/Public Utilities/Transportation  
 70. Mining/Construction/Petroleum/Refining/Agric.  
 80. Manufacturer of Computers, Computer-Related Systems or Peripherals  
 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services  
 90. Computer/Peripheral Dealer/Distr./Retailer  
 95. User/Other \_\_\_\_\_  
 95. Vendor/Other \_\_\_\_\_  
 (Please specify)

2. **TITLE/FUNCTION** (Circle one)  
**IS/MIS/DP MANAGEMENT**  
 19. Chief Information Officer/Vice President/Asst. VP  
 21. Dir./Mgr. MIS Services, Information Center  
 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., Dir./Mgr. PC Resources  
 23. Dir./Mgr. Sys. Development, Sys. Architecture  
 31. Mgrs., Suprv. of Programming, Software Dev.  
 32. Programmers, Software Developers  
 60. Sys. Integrators/VARs/Consulting Mgt.  
**OTHER COMPANY MANAGEMENT**  
 11. President, Owner/Partner, General Mgr.  
 12. Vice President, Asst. VP  
 13. Treasurer, Controller, Financial Officer  
 41. Engineering, Scientific, R&D, Tech. Mgt.  
 51. Sales & Mktg. Management  
**OTHER PROFESSIONALS**  
 70. Medical, Legal, Accounting Mgt.  
 80. Educator, Journalists, Librarians, Students  
 90. Others \_\_\_\_\_  
 (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)  
 Types of equipment with which you are personally involved either as a user, vendor, or consultant  
 A. Mainframes/Supermains  
 B. Minicomputers/Small Business Computers  
 C. Microcomputers/Desktops  
 D. Communications Systems  
 E. Local Area Networks  
 F. No Computer Involvement



"I THINK IT'S TIME HE GOT HIS OWN SUBSCRIPTION TO COMPUTERWORLD."

**YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$38.95\* per year — a savings of 62% off the single copy price.**

First Name \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_  
 Title \_\_\_\_\_ Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48 per year

\*U.S. Only. Canada \$110. Central/South America \$130. Europe \$195. All other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

**COMPUTERWORLD**

E4044B-8

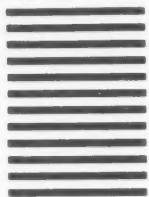
1. **BUSINESS/INDUSTRY** (Circle one)  
 10. Manufacturer (other than computer)  
 20. Finance/Insurance/Real Estate  
 30. Medicine/Law/Education  
 40. Wholesale/Retail/Trade  
 50. Business Service (except DP)  
 60. Government - State/Federal/Local  
 65. Communications Systems/Public Utilities/Transportation  
 70. Mining/Construction/Petroleum/Refining/Agric.  
 80. Manufacturer of Computers, Computer-Related Systems or Peripherals  
 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services  
 90. Computer/Peripheral Dealer/Distr./Retailer  
 95. User/Other \_\_\_\_\_  
 95. Vendor/Other \_\_\_\_\_  
 (Please specify)

2. **TITLE/FUNCTION** (Circle one)  
**IS/MIS/DP MANAGEMENT**  
 19. Chief Information Officer/Vice President/Asst. VP  
 21. Dir./Mgr. MIS Services, Information Center  
 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., Dir./Mgr. PC Resources  
 23. Dir./Mgr. Sys. Development, Sys. Architecture  
 31. Mgrs., Suprv. of Programming, Software Dev.  
 32. Programmers, Software Developers  
 60. Sys. Integrators/VARs/Consulting Mgt.  
**OTHER COMPANY MANAGEMENT**  
 11. President, Owner/Partner, General Mgr.  
 12. Vice President, Asst. VP  
 13. Treasurer, Controller, Financial Officer  
 41. Engineering, Scientific, R&D, Tech. Mgt.  
 51. Sales & Mktg. Management  
**OTHER PROFESSIONALS**  
 70. Medical, Legal, Accounting Mgt.  
 80. Educator, Journalists, Librarians, Students  
 90. Others \_\_\_\_\_  
 (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)  
 Types of equipment with which you are personally involved either as a user, vendor, or consultant  
 A. Mainframes/Supermains  
 B. Minicomputers/Small Business Computers  
 C. Microcomputers/Desktops  
 D. Communications Systems  
 E. Local Area Networks  
 F. No Computer Involvement



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P.O. Box 2044  
Marion, Ohio 43306-2144



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P.O. Box 2044  
Marion, Ohio 43306-2144





# MANAGER'S JOURNAL

## EXECUTIVE TRACK



**Sheleme M. Sendaba** has been appointed vice-president of finance and information systems at Nissan Motor Corp. U.S.A., based in Carson, Calif.

Sendaba, 40, was previously comptroller at General Motors Corp.'s Truck & Bus Group in Janesville, Wis. Before that, he was comptroller of Buick-Oldsmobile-Cadillac in Chicago.

Sendaba began his GM career in 1979 in the MBA financial training program at Buick. He held various positions in finance, IS and other functions, including the post of director of general accounting and special studies at the Buick Motor Division in Flint, Mich.

He holds a bachelor's degree from the University of Illinois and an MBA from the Walter Heller Graduate School of Business in Chicago.

\*\*\*\*\*  
**Thomas A. Maguire** was promoted to executive vice-president and elected to the board of directors of **Smith Barney, Harris Upham & Co.** in New York.

Maguire, Smith Barney's manager of information services, had been a managing director of the firm. He joined the investment banking firm in 1989 from municipal bond trading firm J. J. Kenny, where he was executive vice-president and chief information officer.

Maguire holds a bachelor's degree from the University of Rhode Island and an MBA from the University of Massachusetts-Amherst.

### Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

## Plumbing the soul of IS

*'Computers and society' proponents question social consequences of new technology*

BY MITCH BETTS  
CW STAFF

**V**isionaries say every information system has the potential to change the world, at least a tiny bit.

The question that computer professionals should be asking on the front end of an IS design project is whether it will change the world for better or for worse, according to leading scholars in the field known as "computers and society."

In addition to designing the system to meet business objectives, the scholars are urging IS professionals to consider broader questions, such as: Does the database permit invasions of privacy? Will the automated business system enhance people's jobs, or will it degrade and monitor those workers? Does the technology promote or hinder the social goals of world peace, environmental protection and the like?

Ben Shneiderman, keynote speaker at the first annual conference on Computers and the Quality of Life held in Washington, D.C., last month, urged IS professionals to take responsibility for the social consequences of the systems they create. Guide the technology "to produce the maximum benefits with the minimum harm," he said.

Shneiderman, professor of computer science at the University of Maryland, suggested that computer professionals prepare a social impact statement — modeled on the government's environmental impact statements — at the start of every IS project. "We have a history where the technologists have often been less thoughtful than they should have been about these [social] issues. So I want to encourage technologists to be more thoughtful," he said in an interview.

It is up to the corporation's chief in-



R. M. Kato

formation officer to establish a computer ethics code and ethics training for IS personnel, added Susan J. Harrington, assistant professor of computer technology at Kent State University. "An ethical culture... has to start at the top," she said.

This call for action comes at a time when 45% of the American public agrees with the chilling statement that "technology has almost gotten out of control," according to a 1990 poll by Louis Harris and Associates, Inc. A demographic breakdown of the poll showed that people with low incomes and little education — people who tend to feel that business, government and technology are working against them,

not for them — are most likely to worry about uncontrolled technology, according to Alan J. Westin, professor of public law and government at Columbia University.

C. Dianne Martin, assistant professor of computer science at George Washington University in Washington, D.C., said she blames public distrust of computers on the "mixed messages" delivered by the news media. The public, which swallowed the "thinking machines" hype of the 1950s, now reads about or experiences computer billing errors, computer viruses, privacy invasions and software failures, such as the AT&T network glitch last January.

*Continued on page 110*

## Retail pushes the just-in-time envelope

BY MICHAEL FITZGERALD  
CW STAFF

**H**undreds of information systems executives looking for the latest developments in just-in-time retailing techniques attended the 32nd annual Retail Information Systems Conference (Risccon) in St. Louis earlier this month.

In general, retail stores are moving to on-line, real-time, highly networked environments, said Steve Johnson, managing partner of the central region retail industry practice at Andersen Consulting.

In tune with this theme was an announcement by K Mart Corp. that it had moved part of its 2,211-store telecommunications network off of its IBM

mainframe host to a Stratus Computer, Inc. XA 2200 class fault-tolerant machine.

K Mart said the Stratus CPU has cut inventory replenishment time for its stores from two days to one and has saved money on credit card authorization expenses.

Another major theme of Risccon was how to get top-management support for IS projects. "The CEO must take a role in a project, or it will fail," John A. Hacala, president and chief executive officer of Spencer Gifts, Inc., stated in his keynote address.

Hacala sits on a mandatory-attendance, weekly committee devoted to planning the Spencer Integrated Retail

Information System, a major project designed to completely change the ways in which the company operates.

The question of how to gain support for IS projects from top management surfaced again after an address by Jeff Sobek, director of store systems MIS at the Vons Companies, Inc., a Los Angeles-based supermarket chain.

Sobek, in response to a question on how the IS department was able to get its projects off the ground, credited the company's forward-thinking management.

"Management is progressive," Sobek said. "We don't pilot systems — we consider them the first installation of a chainwide rollout."



## CLIPS



Tim Lewis

Summaries from leading scientific and management journals

### "Information system cost estimating: A management perspective"

By Albert Lederer et al

MIS Quarterly  
June 1990

■ Why do information systems projects often wind up behind schedule and over budget? Part of the reason is that the original estimate fails to recognize the technical complexity of the task.

Project estimates also go awry because of company politics and the personal motivations of individuals. Some of the players in the systems development process want to understate the costs of the

project to make sure it gets approved, while others want to inflate the estimate so they can later boast that the project was finished on time and under budget.

In addition to this political tug-of-war, the IS department tends to stick with its original estimate — even when it should be raised to reflect the user requirements added midstream — to avoid embarrassment and hassles.

Because overruns can destroy IS management's reputation, IS uses three tactics to meet the old estimate:

- Defer deliverables. That is, finish part of the system within the time and money limits, but delay the rest.
- Make programmers work overtime to meet the deadline.
- Use "creative accounting" to hide

some of the project's labor costs.

IS managers should recognize the pervasiveness of political motivations and foster a spirit of cooperation and candor among users, estimators and implementors. — Mitch Betts

### "Managing technology as a business strategy"

By Tamara Erickson, John Magee,  
Philip Roussel and Kamal Saad

Sloan Management Review  
Spring 1990

■ The strategic management of technology consists of an ongoing review process. For success, a research and development program must constantly be revised in light of the firm's business objectives and technological advances.

A firm must determine the mix of markets and products that will yield the optimal cash flow. Then it must consider how well its current portfolio of technologies supports that ideal mix. The highest priority in research and development should be given to key technologies — those mature technologies providing today's competitive advantage. However, the pressure of achieving short-term profit must not cause the exclusion of "pacing technologies" — concepts and processes that must be further developed to offer long-term vitality.

It is critical that R&D communicates directly with manufacturing and marketing, as well as with potential customers. Such links allow clear evaluation of the potential value of pacing technologies and smooth implementation of new products and procedures. — Derek Slater

### "Justifying image management systems"

By Barry Cinnamon

IMC Journal  
September/October 1990

■ There are specific steps needed for a preliminary financial analysis of an electronic image management system: Establish a baseline for comparison, evaluate the image system's costs, analyze its benefits and perform a financial analysis.

In establishing a baseline for comparison between your current system and the imaging system, you need to look at the number of processed documents, size and type of documents, time distribution of document processing, document retention, storage space costs, storage materials costs, document handling and processing time, photocopying costs, overhead costs and personnel costs for each. You also need to determine the image system's hardware, customized software, installation, training, consulting services and system start-up costs.

Such a comparison enables image management benefits to be translated into financial terms. For instance, fewer customer callbacks and improved document processing mean direct personnel savings. A reduced need for paper document filing means reduced costs for office space and filing materials.

At this point, you need to choose a financial technique to complete the analysis. You may want to determine either the present net value, the payback or the internal rate of return of the image system. Regardless of technique, the result will be a hard number. — Lory Zottola



## ALL OUR NETWORKS ARE WELL CONNECTED.

Choosing the best computers for your company is one thing. Making them work together can be a whole different animal.

Fortunately, the network experts at Data Preference have experience with all different breeds of computers and the training needed to get your whole office pulling together.

That's because Data Preference offers everything you need to assemble a network. From PCs to peripherals to minicomputers to workstations to network software. Products that answer to such famous

names as Apple, AT&T, DEC, IBM, Novell, 3Com, and too many more to mention here.

And we offer a fetching range of services to keep your network healthy and well-groomed. Including installation, on-site maintenance, and a toll-free diagnostics hot-line. As well as a full range of finance programs, whether you want to rent, lease or buy.

So, when it comes to keeping your computers well connected, there's only one name worth calling.

Data Preference, the network experts. Why not take a walk to the phone and call us now?

**DATA**Preference

Incorporated

Formerly Leasametric Data Communications, Inc.

Northwest 800.343.7368, 415.574.5797 • Southwest 800.638.7854, 818.708.2669 • Central 800.323.4823, 708.595.2700 • Northeast 800.241.5841  
• Southeast 800.241.5841, 404.925.7980 • London 011.44.923.897000. Copyright © 1990 Data Preference Incorporated.

# "... A HUGE APPLICATION, AND THE 3090 NEVER FLINCHED."

## A USER'S CHALLENGE:

A leading bottled consumer goods producer brought up a mainframe application to gain competitive advantage in its fight for retail shelf space. Within months, it proved so valuable that it grew from five to 15 gigabytes. By the time the company installed an IBM System/3090 Model 200E with 64 megabytes of main storage to manage the application (and run the company's routine IS applications), it was already short of central storage capacity. Rather than slowing down expansion of the strategic job, the company bought Cambex STOR/9000 central storage for a fast low-cost productivity solution. The IS director made the Cambex decision quickly: he had used Cambex memory for years in an earlier IBM mainframe, and knew the Cambex price-performance-reliability solution was a good one. Ask your Cambex representative for more information on this fine user.



## CAMBEX TO THE RESCUE.

Cambex builds IBM System/3090 central and expanded memory — *and now 3990 cache* — storage devices that give MIS executives the ability to add mainframe functionality faster. The Cambex solutions are the only ones that assure 100 per cent compatibility with IBM's own storage cards. That means a fast install, fast diagnostics and superior reliability at minimal risk. In the past two years, 3090 users have installed more than 30 billion bytes of STOR/9000 storage (*and over a billion bytes of our new STOR/3993 cache memory in the past 60 days!*). Make your 3090s do more for less. Call Cambex now.

Cambex Corporation  
360 Second Avenue  
Waltham, MA 02154  
617-890-6000

**Cambex**



Goal Systems' product line  
for the VSE environment ...

**Automated Systems  
Operations**

FAQS/ASO for VSE  
FAQS/ASO for VM

**Production Control  
and Job Scheduling**

FAQS/PCS

**Productivity Tools**

FLEE

**Tape/Disk Management**

EPIC/VSE  
EPIC/CMS

**VSAM Management**

MASTERCAT  
FAVER  
VSAMAJD  
HYPER-BUF  
EXTEND/DASD

**Resource Optimization**

EXPLORE for CICS  
EXPLORE for VSE  
EXPLORE for VM  
EXTEND/VSE  
APAS Solution

**Systems Assurance**

ALERT for CICS  
ALERT for VSE  
ALERT for VM

# THE ULTIMATE GOAL IS NOW

Systems management ... You've told us you're serious about automating, but your products aren't. You've said you spend too much time managing product interrelationships—because integration isn't real. You've told us you need one vendor who will give you systems solutions, and stand behind them—now and in the future.

Goal Systems has heard you. And we're very serious.

We've assembled the most powerful systems management product line. Forward-looking, industry-renowned products—with the depth of function you've been asking for.

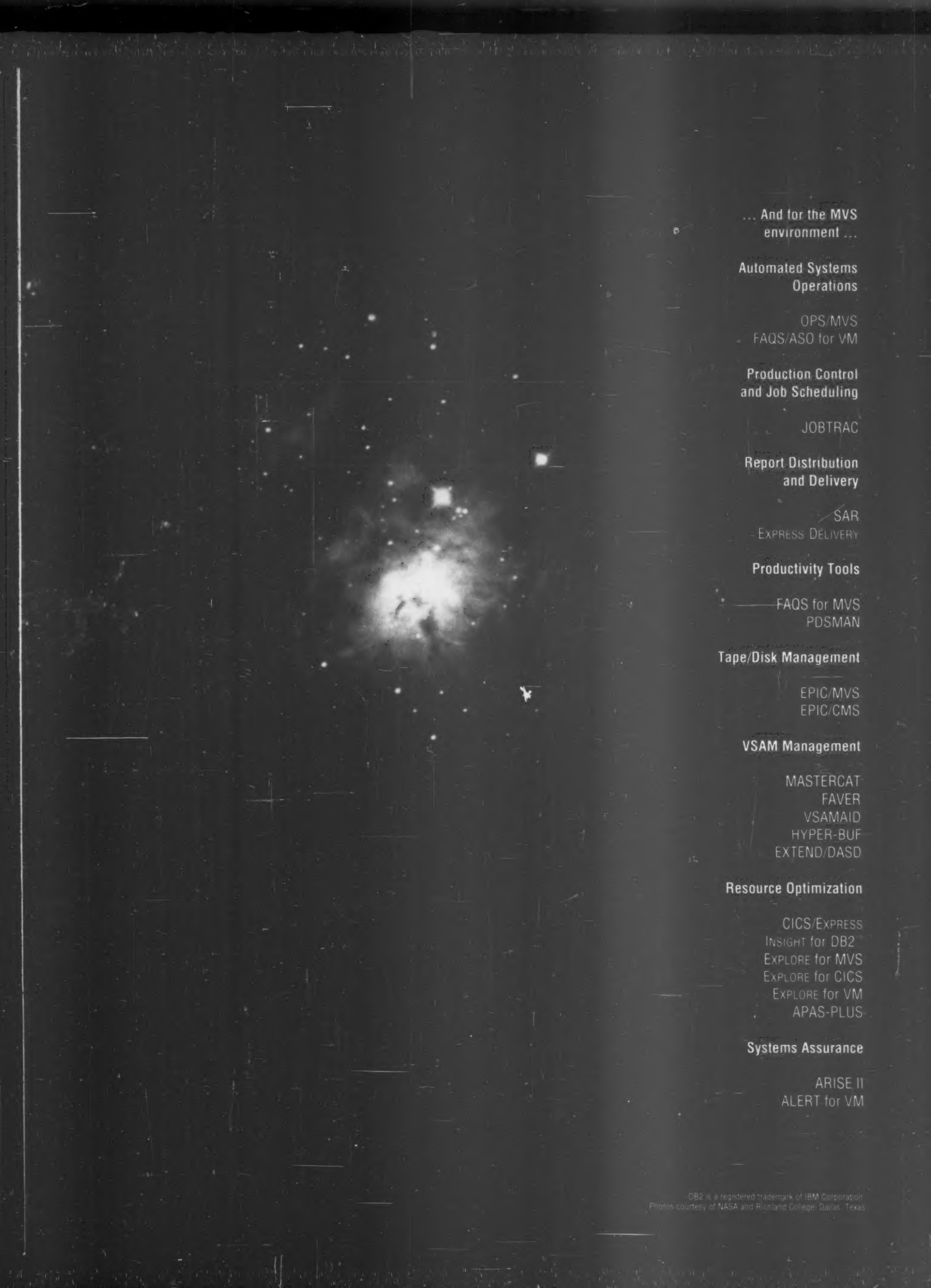
We're pulling them all together to complete our enterprise integration strategy, and give you *real* value. Keeping an eye to the future and an unwavering commitment to quality.

The ultimate goal is now. From one vendor. To reach your ultimate goal, call (800) 829-9002. Just imagine where we can take you from here.



**Goal Systems**





... And for the MVS  
environment ...

**Automated Systems  
Operations**

OPS/MVS  
FAQS/ASO for VM

**Production Control  
and Job Scheduling**

JOBTRAC

**Report Distribution  
and Delivery**

SAR  
EXPRESS DELIVERY

**Productivity Tools**

FAQS for MVS  
PDSMAN

**Tape/Disk Management**

EPIC/MVS  
EPIC/CMS

**VSAM Management**

MASTERCAT  
FAVER  
VSAMAID  
HYPER-BUF  
EXTEND/DASD

**Resource Optimization**

CICS/EXPRESS  
INSIGHT for DB2<sup>®</sup>  
EXPLORE for MVS  
EXPLORE for CICS  
EXPLORE for VM  
APAS-PLUS

**Systems Assurance**

ARISE II  
ALERT for VM

# Fallout from the New York blackout

Some IS staff fired, data centers moved in wake of Aug. 13 power outage

BY JOHANNA AMBROSIO  
CHIEF WRITER

NEW YORK — The blackout that ate lower Manhattan may be over, but its effects are still being felt two months later. Although most companies have not made major changes to their disaster planning and recovery strategies, a handful have gone so far as to fire information systems staffers or move their data centers out of New York.

The power outage began Aug. 13 and lasted almost a week in some parts of lower Manhattan. It left at least 200 data centers in the dark and caused some 24 companies to declare disasters and move to hot sites [CW, Aug. 20]. This made it the largest regional computer-related disaster ever.

This, in turn, has caused plenty of fallout. Tari Schreider, president of Contingency Planning Research, Inc., a Jericho, N.Y.-based consulting firm, said

he has received resumes from five IS professionals who were fired because their companies were heavily hit by the blackout.

These are people whose top management is "using them as the scapegoats," Schreider said. "They're saying, 'It's your fault, even though you told us it could happen and we never gave you the money to do anything about it.'" Schreider would not disclose the names of the companies involved.

Some are looking for new jobs because their companies are moving data centers out of New York, partly due to the power outage, Schreider said. "These companies were thinking about moving anyway. But the blackout was the straw that broke the camel's back," he said.

Citicorp N.A.'s Citibank unit had to move so much equipment

to a New Jersey site during the blackout that IS management decided to move their operations there rather than bring the gear back to Manhattan. Citibank still has data centers in New York, but one will now be in New Jersey, one source said.

Also, the source said, Citibank had to give its home-banking customers credit for service lost because of the blackout — at a cost to the bank of at least \$300,000. Citibank officials did not return phone calls seeking confirmation of that fact.

Another blackout result: The number of companies that have signed with hot-site vendors has increased markedly. John Nevola, manager of IBM's Business Recovery Services Center in Franklin Lakes, N.J., said that the number of customers that signed contracts with IBM in the

months after the disaster increased 15% to 30% compared with the months before the blackout.

Other companies moved up their plans to implement contingency facilities. Participants Trust Co. in New York was going to deploy remote database journaling next year. But because of the blackout, the company is completing that by December. "Our board of directors asked us to do it, and we are," said Pat Buonincontri, senior vice-president.

Still, many believe that the majority of companies will not address the fundamental problems that caused others to be caught short. Most of the difficulties during the blackout were from generators that failed or ran out of fuel — problems that could have been prevented, some said.

"It's not enough to go out and buy equipment," said Kenneth G. Brill, president of Computer-site Engineering, a consulting

firm in Danvers, Mass. "You have to install it correctly, maintain it and test it." Vigorous testing is required under peak loads, for sustained periods of time and for all facets of the computer operation, he said.

"Most people won't do anything," said Alan Freedman, vice-president of technology strategic planning at Bankers Trust Co. in New York. "Most are saying 'I'm glad it's [them] and not me.'"

Bankers Trust, although located in the power grid that lost electricity, "didn't miss a beat," thanks to a \$10 million disaster contingency plan put in place two years ago, according to Freedman.

The plan includes two "pull the plug" tests each year, where the building is blacked out completely to see if everything will continue to function.

"Getting everyone to do that was like pulling teeth," Freedman said. "But now they're thanking me."

## Martin

FROM PAGE 105  
she said.

From robot-run assembly lines to automated bank tellers, computers make the modern world possible, and yet they get a lot of bad press. Bryan Kocher, past president of the Association for Computing Machinery (ACM), lamented in a column earlier this year. For example, the Jan. 29 issue of *Newsweek* had a three-page article on computer failures and noted that plumbers have stricter licensing procedures than programmers do.

Software disasters are also getting some attention in the U.S. Congress. A 1989 congressional study, "Bugs in the Program," warned of possible government regulation — such as mandatory certification of programmers — if the software community does not police itself to ensure software reliability [CW, Oct. 23, 1989].

"The government and politicians are realizing that computing is too important for society to ignore," Kocher wrote. "If we do not manage computing's relationship to government and society, Congress will manage it for us."

In an attempt to develop a consensus on issues such as how to prevent computer disasters like the AT&T network glitch last January [CW, Jan. 22], the ACM has scheduled a special "summit meeting" on Nov. 6-7 in Arlington, Va. The conference on "Responsible Leadership in Computing" will address the problems associated with ultra-

complex software systems and computer models.

Many sociologists, such as Judith A. Perrolle at Northeastern University in Boston, argued that technologists cannot be trusted to make sure that computers benefit society, because they are so enamored of the technology. Computer scientists are beginning to disagree, responding that the profession has matured beyond the stereotype of hackers oblivious to the society around them.

"There is an elite group of computer scientists who deal with the big issues, but the guy in the trenches is worried about his job and . . . doesn't have time to deal with the big issues," said Kenneth Fidel, associate professor of sociology at DePaul University in Chicago.

### Holding to the center

Aware of the conflict between the anti- and pro-technology camps, Ronald E. Anderson, a sociologist at the University of Minnesota and chairman of ACM's Special Interest Group on Computers and Society, said he is trying to forge a middle-of-the-road position.

"Ten or 15 years ago, people felt powerless with the computerization movement coming down on top of them. Now people feel there are some choices, and they're wondering what they can do to make sure machines don't trample us down," he said.

Anderson, who co-chaired the conference with Martin, said he is becoming somewhat more optimistic about technology as the ACM leadership begins to give social and political issues a high

priority. "That reflects a growing concern within the computer science community about better design and more concern about the overall impact," he said.

A decade ago, the "computers and society" field was mostly a forum for computer bashing. Today, scholars continue to raise serious concerns, but the field also acknowledges some social benefits from technology. At the conference, for example, there were sessions about technology assisting people with disabilities and the use of information technology to improve the delivery of social services.

But the greatest challenge of all may be addressing the "equity issue." As Martin described it: "How can computers improve the quality of life for the disenfranchised groups in society, such as the homeless?"

A prime example of how computer experts can become active in social issues occurred last year when members of Computer Professionals for Social Responsibility (CPSR), a group based in Palo Alto, Calif., reviewed a Federal Bureau of Investigation proposal to add a suspect-tracking feature to its national crime database. CPSR was concerned about potential civil liberties violations.

More often, however, privacy and other social issues are raised only as an afterthought. For example, a now-defunct federal program to create a giant database of pharmacy records was nearly implemented before any privacy questions were raised, said Robert Veeder, acting chief of information policy at the White House Office of Management and Budget.

## New priorities

In a break from its previous seven-year history, Computer Professionals for Social Responsibility (CPSR) used its recent annual meeting to focus on issues of freedom of speech, public access to government information and women in computing instead of issues of war and peace.

The organization is also attempting a comprehensive project to "reorient scientific and technology policy away from the narrow concerns of economic competition to more pressing problems like the environment, health and education," said Gary Chapman, the organization's president.

Freedom of speech is not being granted to those who use computer bulletin boards, according to speaker John Perry Barlow, co-founder of the Electronic Frontier Foundation with former Lotus Development Corp. Chairman Mitch Kapor. Barlow told of several instances in which the Federal Bureau of Investigation has seized computer equipment — down to a telephone answering machine — from users who are not criminals but are merely navigating through public networks.

"That's just the tip of the iceberg of government incompressibility of computer crime," Barlow said. He also defended the Southwestern Bell 911 hackers. "Publishing that on a bulletin board is no different than what *The Washington Post* and *The New York Times* did with the Pentagon Papers. There is a failure on government's part to understand the difference between free speech and theft of data."

CPSR is also facing a "crisis in funding," according to Clifford Johnson, manager of administrative computers and the president of the Palo Alto, Calif., chapter. "One has to think in terms of layoffs" for the four-person staff, he said.

This crisis is despite a recent infusion of \$250,000 from Kapor to help the 2,000-member organization address First Amendment issues, according to Johnson.

While educating law enforcement to the high-tech intricacies of freedom of speech, the issue that "needs the most work" remains women in computing, according to Chapman. "I'm struck by the hostility of men for even discussing the subject," he said.

A panel of women presented a preliminary report that shows a decline in the number of women in computer sciences. "All of us in the university have seen a decline in enrollment in computer science, both men and women, but it's much greater for women," said Sheila Humphreys, a professor at the University of California at Berkeley.

Additionally, the corporate culture of short-term profits exacerbates the situation, said Shari Lawrence Pfleeger, chair of the Status of Women and Minorities for the Association of Computing Machinery.

J.A. SAVAGE



## AT&T introduces a breakthrough in video conferencing.

Now that AT&T ACCUNET® Switched Digital Services has 384 kbps, you can dial up full-motion video conferences whenever you want.

Look what just burst onto the switched digital scene: Video conferencing at 384 kbps.

Now that AT&T offers 384 kbps through the public switched network (we're the only ones that do), you can dial up meetings with people outside your private network. And no matter where they are, you'll get such good picture quality, you'll be able to tell how the people on camera like their coffee.

That's not the end of our good news, either. AT&T's new Switched 384 also gives you the capability to transmit bulk data up to six times faster than our competition. And for image transfer and CAD/CAM, SW384 means rapid response time and crisp, clean images.

Just like our Switched Digital Service at 56 and 64 kbps, SW384 offers you a unique, money-saving advantage; it lets you transmit data as often or as infrequently as you need to, without adding new locations to your private network.

And no matter which speed you choose with SDS, you're transmitting over

the only public switched network that's been designed, engineered and fully maintained exclusively for switched digital data transmissions.

So if your network doesn't always go as far and as fast as you'd like, give us a call. We can help you break into a whole new world of high-speed capabilities.

***Innovation.  
Another AT&T advantage.***

For more information on AT&T's ACCUNET Switched 384 Service, call your AT&T Account Executive or 1 800 247-1212, Ext. 108.



**AT&T**  
The right choice.



# Baxter considering life after layoffs

BY ELLIS BOOKER  
CW STAFF

OAK BROOK, Ill. — Baxter International, Inc. has long been regarded as a technology innovator. At a recent company meeting, however, about 100 managers spent about as much time absorbing a radically changed IS organizational chart as they did reviewing electronic mail and computer-aided software engineering (CASE) projects.

In April, Baxter announced a \$566 million restructuring, including a substantial realignment of its information resources group, moving the once-centralized function out to various divisions. Baxter has said it is on target for eliminating half of the 3,200 salaried positions it hopes to eventually cut by the end of the year.

The restructuring was especially hard on Baxter's information systems organization, which will reduce its staff by about 20%. Earlier this month, Baxter explained the new structure to approximately 100 managers from around the world in a three-day, off-site company gathering here.

In addition to fewer bodies, members of the large and centrally managed information resources group had to adapt to new assignments and reporting structures. Except for a core of about 90 people supporting cor-

porate IS, the remaining staff was divided up among the divisions and a newly formed service and maintenance operation.

A second major modification in the new command structure was that IS now reports to finance. Ervin Uskup, former vice-president of business technology at principal U.S. subsidiary Baxter Healthcare Corp. and now vice-president of corporate IS, reports to Chief Financial Officer Bob Lambrix.

Under the old information resources organization, IS Chief Michael Heschel reported directly to Baxter Chairman and Chief Executive Officer Vernon R. Loucks Jr. Heschel left Baxter earlier this year to head Security Pacific Automation Corp.

## Smooth sailing

To keep the new structure working smoothly, a new high-level policy group has been created at Baxter: the Information Systems Management Council (ISMC). The ISMC, with its associated technical subcommittees and the new Systems Architecture Review Board, will chart Baxter's long-term IS strategy. It is responsible for Baxter's mainframe and midrange systems strategy as well as for telecommunications, CASE and artificial intelligence.

"The budget for corporate IR in 1990 was 850 [positions]," Lambrix explained. Of that, he

said, 35 positions were contract programmers and 120 were budgeted as full-time new hires.

On the Baxter IS staff in 1990, only 15 contract programmers were hired, and 135 jobs were cut, Lambrix said.

That left 610 employees for the IS function. Of those, 255 went to Kretz's computer operations and services unit, another 85 went to Uskup in corporate IS, and the rest were distributed among the divisions.

## Staff survivors

One corporate IS staff member, who asked for anonymity, said that morale was better than before the restructuring but that turnover is still high, as staff members continue to answer calls from the headhunters they contacted in April.

"It's the second wave," he said. "We think we're past it, but I couldn't tell you for sure."

To this, Lambrix responded that the first quarter after the restructuring saw a 17% turnover rate, which has since moderated down to 14%. This, he added, is still higher than Baxter's historical 12% turnover rate but not dramatically so.

"As a company, we threw the cards up in the air, and nobody knew what would happen," Lambrix said. "[But] reliability and uptime of our computer systems this year has been better than in the past two or three years."

# UK aerospace employees charged with PC fraud

BY RALPH BANCROFT  
IDG NEWS SERVICE

BRISTOL, England — Police here charged two men and arrested six others earlier this month in connection with an alleged computer fraud attempt at British Aerospace PLC. The two men have been charged with conspiring to defraud the company of \$80 million, contrary to common law.

The people arrested reportedly worked in computer systems at British Aerospace, and the fraud involved the firm's personal computer-based treasury system, which has links to the manufacturing facility. The treasury system is linked via a bank to Swift, the worldwide electronic money transfer system.

The company declined to discuss the details of the allegations. "The police warned us we were the target of an attempted fraud, and we have been cooperating with them," a company spokesman said.

Detective superintendent Roger Clarke, second in command of the Bristol crime squad and in charge of the investigation, said the alleged fraud attempt involved a computer-based transaction. Inquiries are now being made into a number of bank accounts in Australia, Hong Kong, Switzerland and the UK.

British Aerospace uses an in-house treasury operation to move surplus funds on a daily basis to ensure that they get the best rates of interest. The opera-

tion is also used for foreign currency transactions to hedge against adverse movements in exchange rates — a major issue for a member of the pan-European Airbus Industrie, which prices its airplanes in U.S. dollars.

The transactions can involve substantial sums of money. For a firm the size of British Aerospace, they would involve hundreds of thousands, if not millions, of British pounds per day.

Access to the treasury system is controlled by password. From there, a two-password mechanism controls access to a bank's computer system, which would provide the gateway to Swift's

worldwide network. Once linked into Swift, treasury system staff members — or 'fraudsters' — could move money to bank accounts anywhere in the world.

Ironically, at the time of the fraud, British Aerospace was in discussions with a security company about the introduction of a system that would prevent password abuse by double checking the identities of computer users.

The arrests came after police mounted an undercover investigation lasting several weeks. Ten arrests by Bristol police included staff members working at British Aerospace; in addition to the two men charged, two women have since been released, while six people have been released on bail pending further inquiries.

Bancroft is an IDG News Service European correspondent based in London.



## CALENDAR

### NOV. 11-17

**Share 75.5.** Fort Worth, Texas, Nov. 11-14 — Contact: Share, Chicago, Ill. (312) 644-6610.

**Computer-Canada First.** Toronto, Nov. 12-14 — Contact: U.S. Department of Commerce, Office of Canada, Washington, D.C. (202) 377-3718.

**Autofac 90.** Detroit, Nov. 12-15 — Contact: SME, Dearborn, Mich. (313) 271-0777.

**Comdex/Fall '90.** Las Vegas, Nov. 12-16 — Contact: The Interface Group, Needham, Mass. (617) 449-6600.

**Supercomputing '90.** New York, Nov. 12-16 — Contact: Malvin Kalos, Cornell Theory Center, Cornell University, Ithaca, N.Y. (607) 255-7157.

**Hawaii's Governor's Symposium on High Technology: Making Strategic and Technical Alliances for East-West Software Development and Trade.** Lihue, Kauai, Hawaii, Nov. 13-15 — Contact: High Technology Development Corp., Milliani, Hawaii (808) 625-5293.

**Wescon/90.** Anaheim, Calif., Nov. 13-15 — Contact: Wescon/90, Los Angeles, Calif. (213) 215-3976.

**National Conference and Exposition on Electronic Image Management in Government.** Washington, D.C., Nov. 13-16 — Contact: Conference Manager, USPDI, Silver Springs, Md. (301) 445-4400.

**Build Boston '90 Technology Confer-**

**ence.** Boston, Nov. 14-16 — Contact: Build Boston '90, Newton, Mass. (617) 965-0055.

**Strategic Planning for Information and Systems.** Houston, Nov. 14-16 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

**Computing Through Total Customer Service in the Telecommunications Industry.** Los Angeles, Nov. 15-17 — Contact: Matthew Berndt, Center for Telecommunications Management, Los Angeles, Calif. (213) 743-0304.

### NOV. 25-DEC. 1

**Conference on Software Maintenance.** San Diego, Nov. 26-29 — Contact: Michelle Carbone, IEEE Computer Society, Washington, D.C. (202) 371-1013.

**Video Expo.** Orlando, Fla., Nov. 26-30 — Contact: Debbie Rotolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

**Technology Management Forum, Client Serving Computing: The Impact.** Cambridge, Mass., Nov. 27-28 — Contact: Forrester Research, Inc., Cambridge, Mass. (617) 497-7090.

**Cause '90: Challenges and Opportunities of Information Technology in the 90s.** Miami Beach, Fla., Nov. 27-30 — Contact: Cause, Boulder, Colo. (303) 449-4430.

**OSI 111: The Interoperability Advantages.** Arlington, Va., Nov. 27-30 — Contact: Phillips Publishing, Potomac, Md. (301) 340-2100.

**Omni User Annual Technical Conference.** Itasca, Ill., Nov. 28 — Contact: The Omni User Association, Chicago, Ill. (312) 470-8787.

**Microsoft Multimedia Developers Conference.** San Jose, Calif., Nov. 28-29 — Contact: Microsoft Corp., Redmond, Wash. (800) 628-1701.

**Global Advanced Manufacturing Solutions.** Paris, Nov. 28-30 — Contact: Sharon Sutton, National Computer Graphics Association, Fairfax, Va. (703) 698-9600, ext. 336.

**Software Improvement Conference.** Washington, D.C., Nov. 29-30 — Contact: EFD/IMA Conferences, Torrance, Calif. (213) 534-3922.

**X Window System Forum.** Washington, D.C., Nov. 29-30 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

### DEC. 2-DEC. 8

**Executive Information Systems '90.** Washington, D.C., Dec. 2-4 — Contact: Peggy Kilburn, The EIS Institute, Newton, Mass. (617) 965-8366.

**The Dooley Group Executive Conference.** Tempe, Ariz., Dec. 2-5 — Contact: The Dooley Group, Hopkins, Minn. (612) 935-8022.

**Globecom '90.** San Diego, Dec. 2-5 — Contact: Nomi Feldman, San Diego, Calif. (619) 453-6222.

**Automatic Object Recognition Systems.** Los Angeles, Dec. 3-7 — Contact: UCLA Extension, Los Angeles, Calif. (213) 825-1901.

# Du Pont promotes IS exec

BY CLINTON WILDER  
CW STAFF

WILMINGTON, Del. — Raymond E. Cairns Jr., one of the most widely respected information systems executives in the field, got a vote of respect and confidence from his company earlier this month.

Du Pont Co. promoted Cairns, 57, to senior vice-president of IS in recognition of his performance since becoming vice-president of the function in 1985. The new title will not change his responsibilities in presiding over the chemical and oil giant's worldwide systems.

Under Cairns, Du Pont's IS group has earned a reputation for innovative management, education of and partnership with executives and effective use of supercomputing, electronic mail

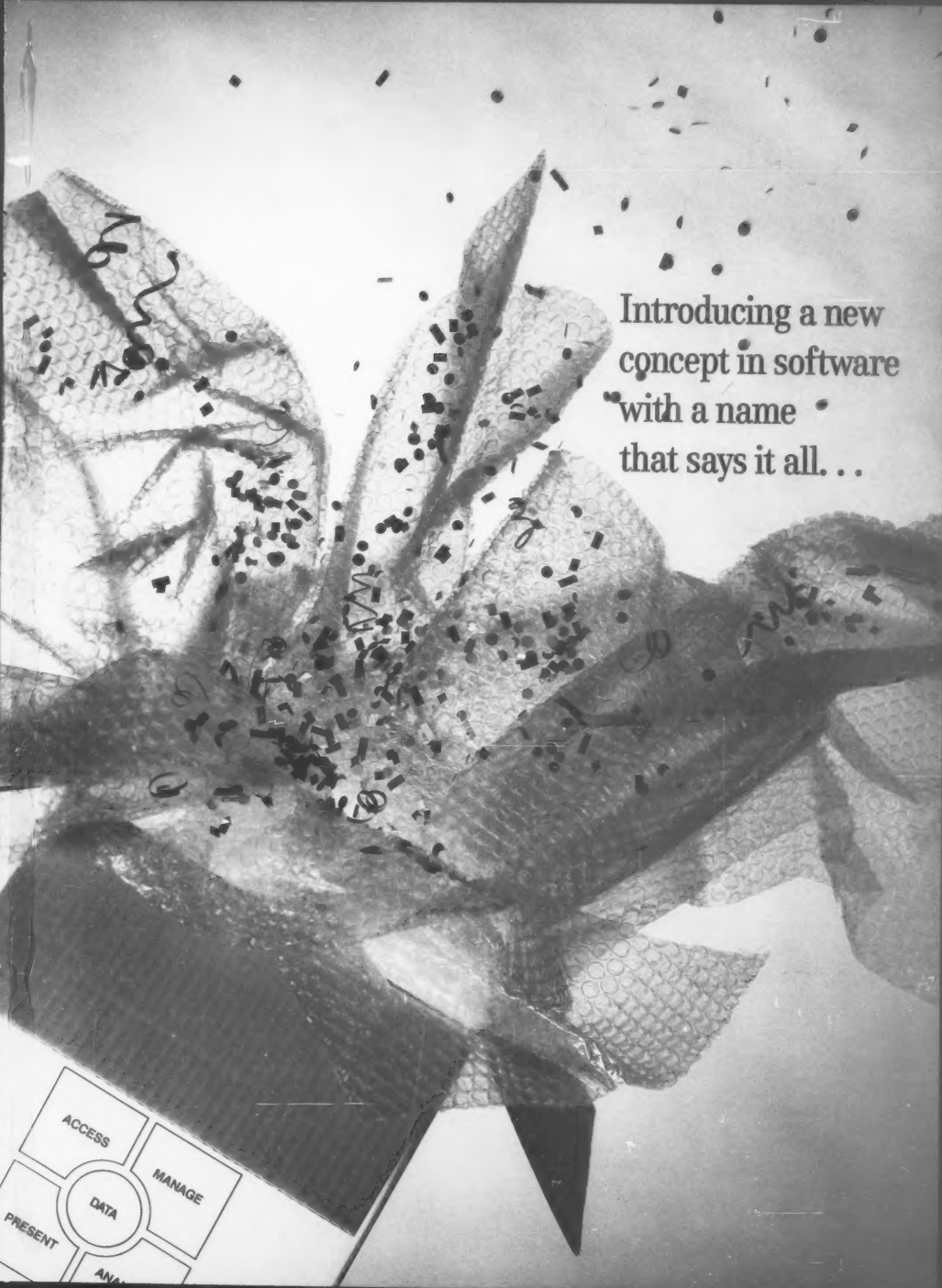
and expert systems.

Cairns joined Du Pont as a research metallurgist. He later became a manager in the corporate plans department and assistant director of IS in 1979. He became director in 1982 and vice-president in 1985.

Three IS directors were promoted to the level of vice-president, including the first woman to reach that level in the IS group. Cinda Hallman, director of the Core Applications Systems Division, was given responsibility for office and decision support systems as well as data management.

Also promoted were directors J. David Mengden, director of computing and networking services, and William H. Hale Jr., director of computer and telecommunications services at energy subsidiary Conoco.





Introducing a new  
concept in software  
with a name  
that says it all...

What's in a name?

Plenty. Especially when the name is the SAS System...the most popular applications system in the world. Over the years, it has come to symbolize reliability, power, and productivity.

# The <sup>NEW</sup>SAS<sup>®</sup> System

**The world's #1  
applications system**

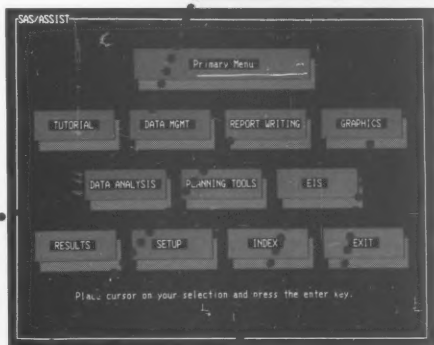
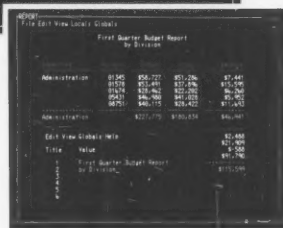
And now the SAS System means even more. It means you have the flexibility to choose software from an *applications* point-of-view instead of a hardware point-of-view. It means you can master the four key data-driven tasks — data access, management, analysis, and presentation — through a single software system. It means you can extend applications to more computer users, regardless of experience level. And it means you'll be the beneficiary, not the victim, of emerging computing technologies.



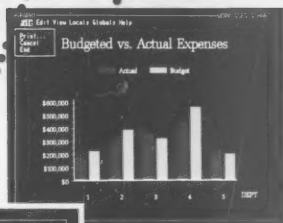
## We've put the emphasis on the end results.

With the SAS System, it doesn't matter who's running an application. Or how. Or where. You can approach the SAS System from any experience level in just about any environment and be assured of the same reliable results.

We've designed the SAS System to be equally responsive to both inexperienced users and power users. At the very center of our new release is a task-oriented, menu-driven user interface.



It's never been easier to access, manage, analyze, or present data. You can even build your own executive information systems.



The menus, powered by keywords, make it even easier to run the SAS System's most widely used applications. Without having to know a word of syntax, users can access a data base...read in data...perform analyses ranging from simple statistics to specialized applications such as forecasting, project management, and quality improvement...and generate a variety of reports and graphs.

If you're approaching the SAS System from an applications development viewpoint, you'll find all the capabilities you'd ever expect in a powerful and productive programming environment. And then some.

There's a command-driven interface especially for systems analysts, applications developers, MIS personnel, and the Information Center staff.

From this interactive windowing environment, you can use the SAS System's English-like commands to build applications in a fraction of the time. And you can customize any application any way you choose by adding user-friendly menus and fill-in-the-blank screens.

**We've made sure you'll never get boxed in.**

While the industry struggles to define a common operating environment, the SAS System eliminates the need for one.

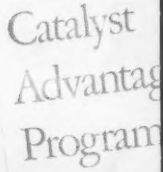
Our exclusive MultiVendor Architecture™ gives you the power to decide where a particular application belongs — in the data center, at the departmental level, on the desktop, or a combination of all three. The SAS System, and the work you do, is portable across the entire range of computing environments.

A dynamic programming interface lets you customize your development environment. As your program takes shape, so do the results.

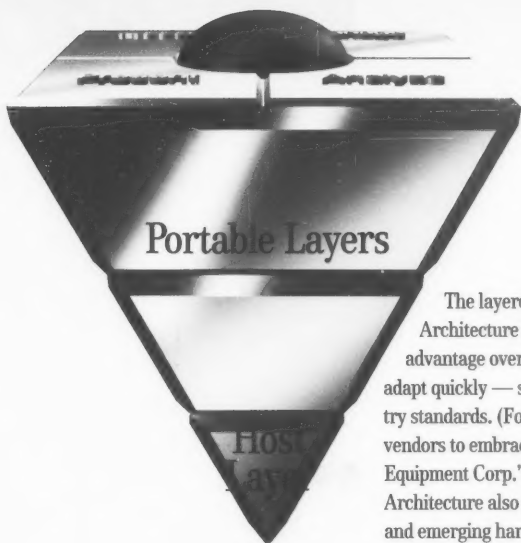
Monitor programs as they execute. Pull-down menus make editing, file management, and other essential programming tasks easy.



Directly access and manipulate the SAS System's English-like command language.







The layered approach of our MultiVendor Architecture gives the SAS System a unique advantage over other software. The SAS System can adapt quickly — sometimes instantly — to new industry standards. (For instance, we were among the first vendors to embrace both IBM Corp.'s SAA and Digital Equipment Corp.'s NAS in one system.) MultiVendor Architecture also gives you the freedom to exploit new and emerging hardware technologies — such as DECwindows,™ X Windows, Presentation Manager,™ and other native windowing interfaces — without worrying about your existing inventory of applications.

With the SAS System, you'll always have state-of-the-art software for state-of-the-art equipment. You'll never again be boxed in to a particular hardware platform.

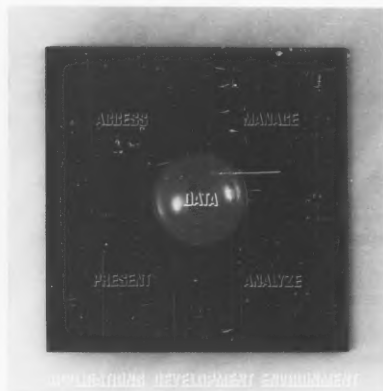
And that's a promise.

SAS software lets you stay on the leading edge of such new technologies as native windowing.



re  
Data General

## We've given you total control in four strategic areas.



There are four data-driven tasks common to all your computing applications. We've designed the SAS System with these tasks in mind.

The first task is to identify and access the data you need. With the SAS System, you'll find direct and transparent interfaces between your applications and the most popular data base management systems such as DB2, SQL/DS, ORACLE, Rdb/VMS, Lotus 1-2-3, dBASE, and SYSTEM 2000. You can get your hands on data without having to

know data base terminology, and without sacrificing data base security. What's more, the SAS System's support of SQL™ gives programmers a standard language for data query. The SAS System can also be used to access raw data files in any format — even files with messy or missing data.

But getting data from place to place is just part of the challenge. Data *management* is also key, and the SAS System responds with efficient ways to enter new data...edit and query data files...and manipulate your data. You can even merge data from totally different kinds of files. And your inexperienced users can enter their data through customized fill-in-the-blank screens that look exactly like your business forms.

```
PROJECT: GLEN PROJECT
Command ***                               DB# 47

Municipal Engineering Project
Design Calculations

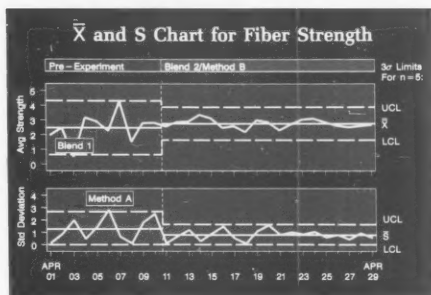
Project: Glen Level..... Engineer: Steve Rowland.....
Station: 380+00..... Date: June 20, 1988.....
Description: Installation of storm drains on roadway 210 and 1010-p

INITIAL DATA:
Cubic feet per second      1      88 cfs
Approximate head wall elevation: 287.50 ft.
Length of pipe             1      92 ft.
Invert                      1      280 ft.  0"
Barrel shape and material   1      Reinforced concrete  Barrel No 58
Trial No. 1      No 58.  B= 859  W= 1210
Lead Engineer Approval: JML
```

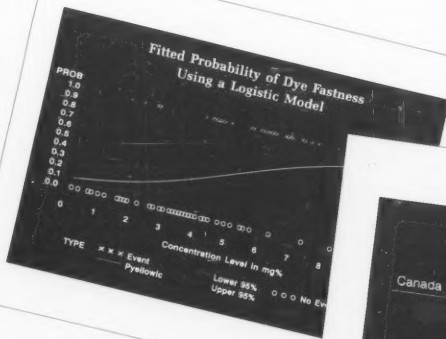
Users can take a common-sense approach to data entry using fill-in-the-blank screens.

Turning data into meaningful information has always been a hallmark of the SAS System. And now you'll find more ways to *analyze* data than ever before... everything from descriptive statistics to advanced multivariate techniques. You'll also find specialized tools for virtually any kind of business need: planning, forecasting, electronic spreadsheets, operations research, decision support, and more. Plus the most sophisticated methods for statistical quality improvement and experimental design.

And once you have analyzed your data, the SAS System makes it easy to get the attention you, and your data, deserve. Our data *presentation* capabilities are unsurpassed — from simple printed lists to spectacular full-color graphics. Here's just a sample:



You can rely on one software to handle all your analytical needs.



	Quarterly Investment Returns			
	Total by Fund Type			
	QUARTER1	QUARTER2	QUARTER3	QUARTER4
Aggregate Growth	\$13,916.00	\$10,135.00	\$20,073.00	\$16,454.00
Bond	\$13,272.00	\$16,561.00	\$13,390.00	\$21,279.00
Capital Accumulation	\$12,291.00	\$9,422.00	\$26,222.00	\$25,191.00
Cash Management	\$15,378.00	\$12,093.00	\$26,116.00	\$10,166.00
Commodities	\$12,982.00	\$11,370.00	\$24,694.00	\$15,248.00
Equities	\$7,633.00	\$10,892.00	\$33,136.00	\$14,645.00
Growth	\$11,870.00	\$13,895.00	\$24,221.00	\$19,255.00
High Yield	\$14,425.00	\$14,757.00	\$23,916.00	\$8,315.00
Tax Exempt	\$12,267.00	\$99,315.00	\$21,846.00	\$139,715.00
TOTAL RETURNS				

**U.S. Direct Investment Position**

Canada	\$50,178
United Kingdom	\$34,990
West Germany	\$20,344
Switzerland	\$17,458
Netherlands	\$11,874
Japan	\$11,333

**The SAS® System.  
More Choices  
for More Applications  
than Any Other Software.**

**And we'll give you a  
free demonstration.**

It's taken a thousand programming years of effort to bring you this new class of software. And we think it's been time well spent.

Now see what you think. Give us a call today at 919-677-8200 to arrange your free demonstration of the SAS System. In Canada, call 416-443-9811.

You'll learn more about the world's first true applications software system — offering you a range of capabilities no other software can match. And backed by the industry's most complete technical support, consulting services, documentation, and training. All from SAS Institute Inc., one of the world's most respected names in software.



SAS Institute Inc.  
Software Sales Department  
SAS Campus Drive  
Cary, NC 27513  
Phone 919-677-8200  
Fax 919-677-8123

SAS and SYSTEM 2000 are registered trademarks of SAS Institute Inc., Cary, NC, USA.  
MultiVendor Architecture is a trademark of SAS Institute Inc.  
Other brand and product names are registered trademarks or trademarks of their  
respective holders.  
Copyright © 1990 by SAS Institute Inc. Printed in the USA.



# EXECUTIVE REPORT

GAINING A PRICING EDGE

## Finding the leeway to price effectively

BY ALICE LAPLANTE

**C**ompetitive pricing seems like a fairly straightforward concept: You either charge less for your product or service than your competitors do for theirs or give customers a darned good reason to pay more.

Start looking at what is really entailed in either alternative, however, and it quickly becomes clear that what you can do with prices depends on a myriad of other operational factors, such as the supply, purchase price and level of efficiency in use of raw materials; manufacturing quality controls; inventory and distribution practices; and so on. Providing a clear and continuous view of all the related operational factors within the business is one of the most important ways that information systems can help a company gain marketplace advantage. Another is through system-enabled process improvements, which either give a company some margin for price movement or a value advantage on which higher prices can be hung.

Information systems can, of course, also be used to analyze various pricing scenarios and administer pricing policies (see stories pages 116 and 120), but that's not where they have their greatest impact. Success does not depend as much on using technology to set prices, says Robert Pratesi, a partner at Index Group, Inc., in Cambridge, Mass. The real make-or-buy contribution of IS to pricing decisions lies in the ability it bestows to change and improve the workings of the business.

In price-competitive industries, many companies do not have the luxury of increasing prices to expand revenues or boost profits. Instead, they must focus on cutting costs through elimination of manufacturing waste and inefficiency. Bama Pie, Inc., of Tulsa, Okla., falls into this category.

Laplanche is a free-lance writer based in Palo Alto, Calif.



Bama Pie's Charles Green and Bill Chew get the mix right with a little help from information systems

Bama manufactures pies and biscuits sold by McDonald's Corp. fast-food franchises throughout the world, as well as other retail foods that are distributed through grocery stores nationwide. The company competes with such multinational giants as Pillsbury Co. and Nabisco Brands, Inc. in a market in which new products debut weekly, shelf space represents a vicious battleground, and profit margins are regularly shaved in recurring price wars.

In mid-1989, Bama management decided that the company must be able to respond more quickly to changes in raw goods — specifically, the daily fluctuations in the price of staples such as flour and sugar — as well as

more accurately monitor inventory and sales of finished products.

"We realized that our reaction time to changes in the cost of raw goods was critical but that we were not able to take control, due to lack of information," says Charles Green, Bama's MIS manager.

When Green began searching for commercial software that would help the company track raw material costs, he could not find anything that would run on the company's NCR Corp. 9000 mainframe computer. So in December of 1989, Bama purchased an IBM Application System/400 and Marcam Corp.'s Prism manufacturing planning, control and costing system, de-

signed for process manufacturers using IBM mid-range computers.

Almost immediately, the firm found ways to reduce costs. "We thought we were adding 110 pounds of flour [to one recipe], and we were really using 115 pounds," Green says. Nor was this an isolated instance of mismeasurement. Twice the necessary amount of shortening was regularly being added to the mix for another product.

Green worked closely with Bill Chew, vice-president of finance at Bama, figuring out exactly how to deploy the system and what reports were needed. Since it came on-line at the beginning of the year, Chew says he has been able to get his hands on valuable data that was previously inaccessible — data he needs in order to run a profitable business.

"I can analyze sales by geographic region, by customer type, by customer profile, by time period, by broker and by numerous other factors," Chew says. "I now know what effect seasonality and promotions have on sales."

Even more important to him, however, is the fact that he now has considerably more control over what the company pays for raw ingredients. "The price of flour changes daily," Chew says. "So does the price of shortening. I am always contracting for raw ingredients from different brokers, and now I know exactly how it affects my profitability if the cost of something goes up."

Another benefit of the system acquisition is the precision it brings to the contract-bidding process. "In the past," Green says, "when a customer asked us for a price estimate on a new product, our sales staff would try and get a ballpark figure, but it was a very tedious operation, done by hand and, ultimately, wasn't very accurate."

Furthermore, because price-  
Continued on page 114

### INSIDE

#### Playing the market

Page 116

#### Wholesale deal-making

Page 120

Continued from page 113

setting was usually the last step in a new product proposal and, even then, more a close guess than an absolute, the company had often found itself locked into unprofitable agreements.

Green says Prism has already saved the company substantial money by red-flagging those proposals that are unprofitable. "Now we can see much more quickly if a product is not feasible," he says. "To be honest, some of our current products would not have been attempted had we known the true costs."

Another immediate benefit of the new system was improved inventory accuracy. Bama maintains a number of warehouses across the country, and these warehouses are now able to handle their own inventory management rather than simply filling out forms for inventory tracking at company headquarters.

As a result of this modification, inventory variance — in other words, the difference between the inventory on paper and the actual count of products on warehouse shelves — has been greatly reduced. One warehouse has even come in with a zero inventory variance for the past five months.

"That is truly an amazing feat and one that has an immediate, quantitative effect on the company books," Green says.

If cost savings and pricing latitude are important in the pie and pastry business,

they are even more crucial in industries in which consumer taste takes a definite backseat to terms.

#### Escaping commodity class

In the highly competitive vehicle-leasing business, participants are resigned to operating in a commodity market, one in which price is the only thing that differentiates one vendor from its competition.

"Leasing four tires from one company is viewed the same as leasing from another," says Larry Runge, director of advanced applied technologies at GE Capital Fleet Services in Stamford, Conn. Although value-added service can sometimes make a difference, he says, that is not what lessors look at during price wars, which are almost constant in this business. So the only way to survive is to reduce costs so that profitability goes up even if prices remain constant or go down.

"If it costs your competition \$100 per transaction to serve a customer and you can reduce your costs to \$90 per transaction, that gives you an edge," says Runge, who was brought into GE Capital Fleet from GE Aerospace for the specific purpose of designing a new information system. His instructions, Runge says, were to build a system that would both help the company identify and trim excess costs from operations and assist in identification of value-added services that custom-

ers would pay to get.

As with all mission-critical applications, speed of system development and installation was a critical factor. In February 1989, Runge put together a development team. By September 1989, requirements for the \$20 million system were complete. Coding began around Thanksgiving, and the first functional modules were delivered in March 1990.

What Runge tried to accomplish is best illustrated by the automation of the GE Capital Fleet control room, where 65 mechanics are on call 24 hours per day to help customers on the road who experience problems with their vehicles.

Before the new system was installed, a typical customer call entailed making three separate data requests to the mainframe. Runge designed a system that involved only one mainframe transaction in which all necessary data was downloaded from the mainframe to the personal computer in one client/server request.

One portion of the system enabled the mechanics to look up on-line the name of any service station in the country by ZIP code, phone number or city. Data was also made available on the quality of the service provided by each vendor. This system replaced a cumbersome combination of limited on-line data supplemented with three-ring binder notebooks.

The mechanics now had much more detailed information at their fingertips. In addition, an entire costly step — converting paper data into electronic information — was completely eliminated.

#### Controlling repairs

But the really big savings for GE Capital Fleet, according to Runge, come from the fact that the company now has a way of verifying, authorizing — and thus, controlling — expensive repair costs that can take place on an emergency basis anywhere in the country.

As always, when a GE Capital Fleet vehicle breaks down, the customer takes it to a local garage or service center, which then contacts the GE Capital Fleet mechanic hot line with repair estimates. But what happens at that point is now completely changed.

The mechanics, in addition to having extensive data on most repair facilities around the country, have the entire history of that particular vehicle available at the touch of a keystroke. Thus, the age of the vehicle, the mileage, any repair work performed and even statistics on the particular make, model and year of the vehicle in question are provided.

"Now we can tell if a particular repair estimate is reasonable," Runge says. "If a car only has 10,000 miles on it, and a garage in the middle of Wyoming says it needs a new exhaust system, a warning screen pops up."

#### Finding the value added

It has become quite common in industries in which fierce price competition is the norm to talk about putting "value-added service" into otherwise commodity-level products in order to maintain profit margins — but it is another matter altogether to successfully accomplish this. Still, consultants and pricing managers agree that it is achievable and that IS can help.

"When your customer perceives that you are providing an outstanding or extraordinary service level, price becomes less of an issue," says John Cunningham, a consultant at KMD Associates in Stamford, Conn. Cunningham says that compa-

nies providing adequate service can maintain average pricing within an industry, whereas firms offering extraordinary service levels enjoy a 9% price differential over the industry average. For 80% of businesses, Cunningham says, information systems provide a viable way to accomplish this.

#### Question everything

Frequently, the hardest thing to determine is where information systems can make an appreciable difference. Many profitability-enhancing process improvements are only obvious after the fact. The best rule, consultants say, is to uncover and question as many assumptions as possible about the way that work is accomplished.



GE Capital Fleet's Runge built a system to identify trimmable costs

"There's the sin of incrementalism," Cunningham says. "You really need to clear the decks of all expectations and past practices in order to reap the benefits that an innovative information system can offer."

According to Index Group's Pratesi, the Japanese are much more proficient at taking a fresh approach, and U.S. businesses can learn quite a lot from them.

"If Americans get a 10% to 15% better return on our investment, we think we've done our job," he says. "However, if an organization is willing to rethink the way they work, instead of incremental gains, they can realize improvements of 80% to 100%."

Ford Motor Co. provides one example, Pratesi says. Ford wanted to increase efficiency of its accounts-payable department, which employed more than 500 people. "It thought it could possibly eliminate 10% of the accounts-payable personnel by overhauling the on-line system," he says.

At about the same time, however, Ford bought a share of Mazda and got a peek inside that automaker's accounts-payable department, which consisted of five employees.

When Ford management visited the Mazda plant, Pratesi says, it saw a fundamentally different method of handling accounts-payable: No paper invoices were used. The whole notion of having an invoice was eliminated: "In effect, the on-line capability of the system made paper invoices — and all the attendant work involved in creating, filing and accessing them — obsolete," he says.

## Assessing profitability

Most companies fail to do the single most useful thing they could do to improve overall productivity, says Michael Packer, a consultant at The MAC Group, a management consulting firm in Cambridge, Mass. What organizations should be doing, he says, is carefully calculating all the real costs involved in each customer transaction and using that as the basis for pricing decisions.

What many firms do not take into account, Packer says, is the fact that "one customer transaction could be much more profitable than another — even if it involves the sale of the same quantity of the same product." For example, he says, the fact that one client is located 10 miles further away than another can actually make the difference between profit and loss.

"If you think of things in terms of transactions, not just volume of sales, it becomes much clearer," he says. "In one company we studied recently, it turned out that 50% to 70% of its transactions were not profitable."

Covia Corp., the Rosemont, Ill., reservations organization, has become a fervent practitioner of the kind of transaction cost scrutiny that Packer preaches. Originally the computerized reservations arm of United Airlines, Covia now operates as a separate corporation, serving other major airlines as well as hotel chains and other travel-related services worldwide. Covia recently changed its billing system to more closely reflect the true costs of its daily business, according to Tom Colten, manager of pricing.

"We needed to bring our revenue stream in line with the actual transactions we performed in our bookings," Colten says.

The reservations industry is unique in that although it sells its services through travel agents, who book flights and hotel rooms for clients using the computerized reservations system of their choice, it is the airlines and hotel chains that actually pay for the services. At the end of each billing period, each airline and hotel is charged by the reservations services based on the bookings made by travel agents.

Other airline reservations services, including American Airlines' Sabre system, bill airlines and hotels on a "net booking" basis — only for the tickets actually used. Thus, if a traveler first makes, then cancels, a reservation to fly to Japan, there is no charge to the airline for that service, even though the reservations agency has incurred costs during the process.

But Covia decided to change that system, and as of one year ago, began charging airlines on a transaction basis. So if a flight reservation is made, then canceled, the airline gets charged for both transactions. There is now a clear correlation between the communications and processing costs involved in making, changing or canceling a reservation and the amount billed to the airlines.

The new costing realignment has helped Covia maintain profitability and has improved its ability to invest in the development of new computerized services, Colten says.


ALICE LAPLANTE

# INTRODUCING A VERY CIVILIZED WAY TO BLUDGEON YOUR COMPETITION.

Beat the competition—before they beat you. That's the challenge in the technology business. And only companies that arm themselves for the fight will be around to compete tomorrow.

To survive, you've got to do more than just build a good product. You've got to get it into the hands of real buyers, and tell your product story better than the competition.

Now, in Atlanta, there's a place where you can do both. INFORUM. A powerful direct sales environment that puts you face-to-face with qualified buyers, at the moment of their buying decision.

- 
- ☐ I'm not particularly interested in telling my product story better—or increasing my market share. But thanks anyway.
  - ☐ I'm ready to start bludgeoning. Send me information on the tools that can make my company a smashing success.

If you want immediate gratification, call us toll free. The number's on the right.

MAIL TO: INFORUM, ATTN: ANITA TIDWELL  
250 WILLIAMS STREET, ATLANTA, GA 30303.

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Zip \_\_\_\_\_

Phone \_\_\_\_\_

**INFORUM**

SHOW THE WORLD  
WHAT YOU'VE GOT.

At INFORUM you tell your own story. You demonstrate your product's advantages.

And you control the sales process. Completely. Every single business day of the year. It's no wonder INFORUM is rapidly becoming the center stage for technology sales and marketing.

Certainly there are other tools you could use to bludgeon your competitors. But in comparison to INFORUM, they all seem rather primitive.

1-800-343-5045



## Using pricing to change buying patterns

*Systems can help companies put the bite on competitors with variable pricing strategies*

BY BARBARA FRANCETT

Few people know better than Don Burr, the former chief executive officer of now-defunct air carrier People Express, the value of an information system for reacting to competitive pricing challenges. People Express didn't have one. But American Airlines and United Airlines had their Sabre and Covia systems, respectively, and that, Burr says, is how they were able to respond to People's low rates — and ultimately drive their younger competitor out of business.

"Our pricing was simple: \$29 peak and \$19 off-peak. They took the price down to nothing and blew us away," Burr says. In just months, People Express slid to near bankruptcy.

"Variable pricing is very complex," Burr continues. "American and United invested billions in their systems." With them, the two airlines can make hundreds of thousands of pricing changes daily.

American and United match seat sup-

ply with many demand patterns, Burr says. Thus, they can sell more tickets at higher rates than competitors, while still cutting prices whenever necessary. "If we'd had a variable pricing system, we'd have done the same thing," he says.

IS can supply that crucial pricing edge to maintain customer interest in current products and keep competitors at bay in a couple of ways, says Jim Webber, president of Omicron, a Mountain Lakes, N.J.-based consortium of 60 major firms formed to share IS insights and experience.

"Services like the airlines and utilities can use pricing to change buying patterns," he says. "Consumer products companies can use information technology to build 'what if' pricing models to predict profit and market share."

At Alamo Rent-A-Car, Inc. in Ft. Lauderdale, Fla., an expert system is key to managing highly variable pricing structures. "You want to set the highest price consistent with marketing objectives," says Tom Loane, an Alamo vice-president. "You want to grow volume, make a profit, dominate the market and do it all by tomorrow."

Alamo chose The Integrated Reasoning Shell (TIRS) from IBM. TIRS runs on a Personal System/2 Model 70 tied to a local-area network. Although Alamo has

been working with the system since the beginning of the year, it has only recently gone into production. "An expert system approach is consistent with the conflicts and uncertainty in our business," Loane says. "We're dealing with a product that is perishable. Cars move around fairly readily; so, unlike airlines, we can add seats very quickly. We have a greater degree of flexibility but

more complexity, too."

That complexity takes the form of about 2.8 million different rates. "We must also consider volume and be consistent across cities," Loane adds. "This is a very significant system."

Manual methods simply cannot analyze all the variables and conflicting signals, Loane says. "We have to take into account our position against national and regional compet-

itors — as well as demand and fleet availability — multiplied by 100 cities by 365 days by 43 models."

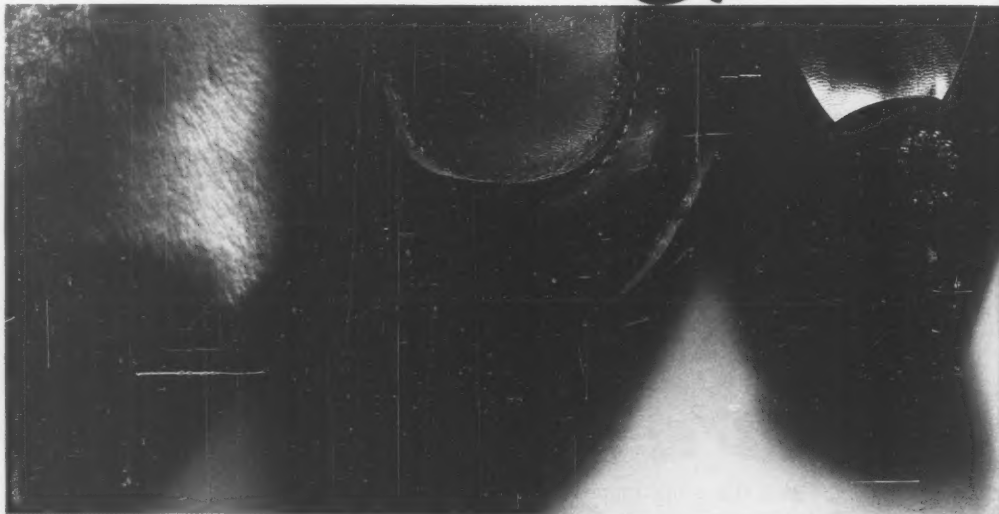
The system helps Alamo respond rapidly to competitive pressures. "For example, we might have plenty of cars available, but our competitors raise their prices," Loane says. "What do we do?"

TIRS will make recommendations based on specific competitive data and generic demand factors. "Our decision will depend on the circumstances," Loane says. "That's what pricing is about."

An information system can also provide a means for keeping existing product lines optimally priced. Avon Products Co. in Rye, N.Y., taps an internally developed price history and sales volume system to predict the performance of new price



# Technology for



Bankers, nuclear physicists, athletes, students and scores more can walk right into a virtual shopping mall of information. How? The answer is an exciting on-line gateway service called NYNEX INFO-LOOK<sup>®</sup>, developed by our Science & Technology Center.

To enter, all you need is a computer, modem, and a calling card from New England or New York Telephone. It's that simple because we designed special software that allows your computer to interact directly with the database that holds the verification and billing information. So instead of waiting days to receive confirmation and a password by mail, you have only to wait milliseconds.

Francett is a free-lance writer based in Bloomfield, N.J.



points for its 5,000 products.

The frequency of the company's sales campaigns, in combination with its ever-changing prices, products and special offers, make the system especially important, says Jim Hoffman, director of worldwide systems. "For instance, if we're offering a particular product in campaign 20, we would look at the history of the product at \$2.99 and maybe discount it to \$1.99."

Products offered in combinations at special rates further complicate pricing, as does the type of product offered. "It's much easier to predict the price performance of standard products, like lipstick," Hoffman says, "than new or seasonal items, like figurines or toys."

With the price history system, Avon

**Y**OU WANT TO set the highest price consistent with marketing objectives. You want to grow volume, make a profit, dominate the market and do it all by tomorrow."

TOM LOANE  
ALAMO

also uses an inflation-factors database to track and analyze the costs of specific materials, such as glass for fragrance or after-shave decanters. "This information is integrated with the price history information. The marketing group then determines product prices," Hoffman says.

Both systems run on the company's

IBM 3090/600 mainframe with DB2, Hoffman says. The last piece of the price history system was added a month ago following a two-year development effort.

Determining how high prices can be pushed is difficult, Hoffman says, because "Customer loyalty is hard to measure, but we can look at the history of products and

get a pretty good curve of unit sales vs. price."

The Hon Co., an office furniture manufacturer based in Muscatine, Iowa, uses a recently developed homegrown report writer to analyze buying patterns and develop new terms and conditions for its customers, says Jim Goughenour, vice-president of customer service and distribution.

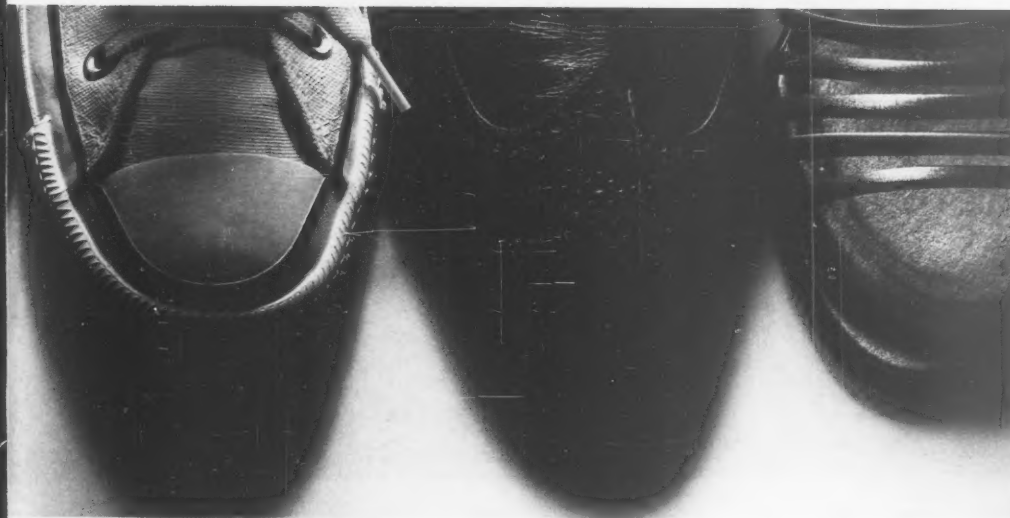
This approach to pricing is far more sophisticated than the rudimentary method the company used in the past, Goughenour says. "Once, if inflation was 5%, we simply raised prices by 5%. Now, we analyze products and customers by type, as well as looking at the costs associated with the particular channel of business."

It's no small task. The company manufactures 48 product lines consisting of about 35,000 to 40,000 stock-keeping units, Goughenour says.

The system runs on the company's Unisys Corp. A15 mainframe. "With the report writer, we can download mainframe information to analyze on our PCs using programs like Lotus or Excel," Goughenour says. "We can scan several million records to see buying patterns."

The company has gleaned several important benefits from the system. "We found areas where we could sharpen our pricing to balance better across the country and our distribution channels," Goughenour says. "We were also able to

# all walks of life.



The software is so successful, we're offering it to other telephone companies for their gateway services.

The NYNEX® family of companies can offer you everything from network services and software to computers and systems integration. So call us at 1 800 535-1535.

It's a step in the right direction.

*Need to communicate? Need to compute? The answer is*

**NYNEX**

© 1990 NYNEX Corporation.



Alamo's Loane says computers improve rapid-response capability

change our discount schedule structure to make it easier for our customers to understand. Finally, price restructuring gives us a way to increase our penetration to wholesalers."

IS can help maintain competitive strength at the retail store level as well, says Bob Dylan, chairman of the marketing department at Harvard Business School in Cambridge, Mass. "They can impact the frequency of price deals. In some product categories, 70% to 80% of the business is 'done on deal,'" Dylan says. "But how deep should the deal be? Should you offer a deal at the same time as your competitors? Information technology can recommend how to promote products and when to offer specials."

Finally, although IS can help companies keep that critical pricing edge, skill in its use is equally vital, users agree. "You need the talent to know what to do with the system," Burr says. "That makes all the difference." ♦

# My network upstairs won't talk



## Now what?

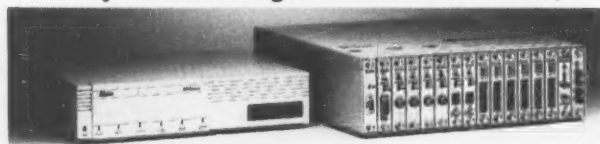
It seemed so simple. You had to connect two LANs so you put in a repeater. Then more LANs cropped up, and more network traffic appeared, so you put in a bridge to improve response times. And then you breathed easier because the network was segmented and under control again. Until other networks sprang up in other cities. Dallas. New York. L.A. Paris. With each running different protocols. What began as a simple project is now a geo-strategic headache.

It doesn't have to be this way. You can manage growth on your network less painfully. With

NETBuilder™ and MultiConnect®

NETBuilder combines a bridge, router, or brouter in a single hardware platform. You choose the solution you need by changing a single diskette. And you can transform NETBuilder from local area to wide area by adding a single board.

As your network grows around the world,



# with my network downstairs.



NETBuilder makes network management easy. You can install, configure and manage your network from any workstation on your system worldwide. And because 3Com is an active leader in developing network management standards, your 3Com® network management system will be interoperable with the rest of your network products. What's more, as you segment your network, MultiConnect Ethernet repeaters allow you to mix and match virtually any cabling medium.

The result: modular internetworking that lets you manage your network growth intelligently.

To learn more, just call 1-800-NET-3Com Dept. D5013. You'll receive a detailed internetworking tutorial, along with an introduction to 3Com inter-

networking solutions. At 3Com we make products that network more types of systems to more types of systems. Whether it's network adapter boards, operating systems or servers. Because what good is connectivity along one part of the network if you can't rely on the rest of it as well?

## 3Com

We network more types of systems  
to more types of systems.™

© 1990 3Com Corporation, 3165 Kifer Road, Santa Clara, CA 95052. Telephone (408) 562-6400. 3Com, NETBuilder, MultiConnect and the 3Com tagline are trademarks of 3Com Corporation.

# Complex price structures call for improved controls

*Industries look for flexible systems to manage deal-making*

BY LARRY STEVENS

At times when prices remain relatively stable and distributors receive a constant discount off the retail price, traditional order entry and accounts-payable software packages are sufficient.

However, many industries are now experiencing wide fluctuations in the cost of raw materials. These fluctuations, as well

as the need for aggressive pricing in order to maintain market share, are causing a lot of companies to seek more flexible systems for pricing administration.

Process industries, which produce an extensive range of products using many different types of raw materials, are quite often hit particularly hard by price fluctuations.

Roger Falen is the information sys-

tems manager at Mannapro, Inc., a large animal feed company based in Denver. The company, which sells almost entirely through distributors, currently has more than 500 products, many of which are made with more than a dozen raw materials.

There is a standard formula that governs routine price setting at Mannapro. It entails tallying Mannapro's cost of raw materials for a product and adding a percentage, which is negotiated at set intervals with each distributor and is based on the distributor's volume.

At one time, Falen says, it was possible to handle all pricing using that formula and a calculator. Ten years ago, the calcu-

lator was replaced with a computer programmed with a simple routine that performed the same kind of calculation. That worked fine until four years ago, when it became apparent that routine pricing was starting to be less the rule than the exception.



## Calculating tolerance

Mannapro's existing system lacked a number of the features necessary to handle the company's real-world pricing practices.

The first was the ability to consider the "price elasticity" of the various products. Falen points out that markets vary in their tolerance for price increases.

In some cases, when production costs increase, prices can be adjusted to absorb the change. There are, however, other markets that have little or no tolerance for any kind of price hikes. Raising prices on products in these areas is likely to cause a drop in demand and a loss of market share.

Four years ago, Falen purchased Cost Pricing System (CPS) software from Agri-Data Systems, Inc., which allows him to account for price elasticity by specifying how much weight to give the cost of raw materials in determining the price of each product.

"Price elasticity used to be a seat-of-the-pants judgment made by the person

**A**BOUT 70% OF marketing energy now goes toward creating deals: deals to distributors to encourage them to sell more of a particular product and discounts that are passed on by distributors to consumers."

GEORGE WILLIAMS  
ANDERSEN CONSULTING

who happened to be quoting prices to a distributor," Falen says. "Now the price is more or less standardized."

The system does not always rule, however. Although it is designed to account for price elasticity, there are still numerous occasions on which the market price for a product differs from the price computed by Mannapro's system.

"At least half the time," Falen estimates, "we're ruled by influences outside our company. When that happens, we have to ignore what CPS tells us and sell at the market rate, or we don't sell at all."

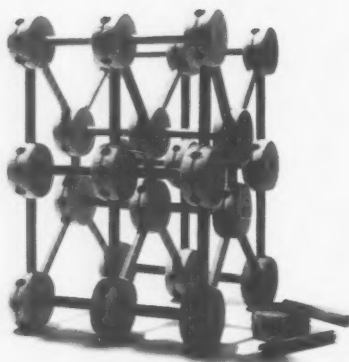
## Product handicapping

Occasionally that means selling at or even below cost. And, in such instances, the job of the information system switches to one of impact tracking. With the old system, there was no way to track the financial result of that action. An advantage of CPS is that it gives Falen retrospective reports showing in detail the financial consequences of each sale and the profitability of each product.

These reports can tell the firm when a

Stevens is a free-lance writer based in Springfield, Mass.

## THE MAINFRAME IBM WON'T PUT TOGETHER FOR YOU.



When Meridian's technical whizzes get going with their inventory of parts and features (we call them "tinkertoys"), they can build you a mainframe solution—like a customized IBM 3090—that will fill your exact needs. Something the 3090's parent company won't always do for you.

Let's say you want to go from a 150 to a 150S. That's an upgrade that doesn't exist from IBM. But it does from Meridian. We'll search our extensive inventory for the right tinkertoys, then we'll custom build your machine for you. Of course, we don't stop there. We also get your 150S certified by IBM, so you won't have to worry about service.

Even if the upgrade is available from IBM, Meridian can usually offer a less expensive way to get where you want to be. Just tell us where that is, and we'll suggest a number of less costly, just-as-effective alternatives to buying new. We'll also structure the lease or financing that works best for you. (And we're not confined to strictly IBM equipment. We also work with Amdahl, Hitachi, DEC and many others.)

If you're in the market for a customized upgrade, remember Meridian's "tinkertoys." And remember Meridian's phone number: (708) 940-1200, or write Meridian, 570 Lake Cook Road, Deerfield, Illinois 60015.



M E R I D I A N

T E C H N O L O G Y L E A S I N G S E R V I C E S



product is no longer profitable so it can consider getting out of that particular market. They can also reveal important details that go beyond cut-and-dried separation of the profitable from the unprofitable.

It is possible, for example, to ascertain that even though a product is not profitable on its face, it is worthwhile to manufacture, even at the current price, because its use of a particular raw material helps to lower the company's costs for that material in the production of other goods.

#### The art of the deal

Process industries are not the only ones struggling with the need for greater flexibility and better control of information in price administration. Companies operating in other spheres are also finding it necessary to institute more creative pricing strategies and install software systems to support them.

Consumer products companies are particularly active in this regard. George Williams, a partner at the Denver office of Andersen Consulting, estimates that at such companies, "about 70% of marketing energy now goes toward creating deals: deals to distributors to encourage them to sell more of a particular product

great difficulty, however, was tallying up data pertaining to such things as quarterly breaks, quantity discounts, truckload surcharges and discounts for items purchased within a certain time period.

In order to permit computerized tracking of these complex pricing variables, the IS department had to resort to patchwork solutions. For example, it constructed a procedure for dealing with complexity by assigning multiple deal-specific numbers to each product. This meant that if a distributor purchased more than a certain quantity, the product would have a different number than the

same product when bought in a smaller quantity. This cumbersome system resulted in errors and hindered record-keeping on product profitability.



The advantage of Extended Pricing, which can handle different prices for the same product, is that it makes accounting reports less complex.

The system is also able to generate reports on the profitability of each deal.

This helps the company study the effects of its past strategies to help in price planning.

The IS manager also says that the new system gives the company more flexibility

to quickly respond to changes in the business environment. For example, if freight prices increase, he can type in one figure to add a truckload surcharge for all products or for certain classes of products. Previously, he would have had to add the surcharge to each product individually.

Complex pricing was once the exception at many companies, and IS managers felt comfortable accommodating special circumstances with temporary fixes. But in recent years, multitiered price structures have become an integral part of many companies' marketing strategies.

Williams says, "When IS finds itself working around the software in order to reflect a new price and it has to do that more than once every quarter or so, it's time to look for a new system." •

**P**PRICE ELASTICITY used to be a seat-of-the-pants judgment made by the person who happened to be quoting prices to a distributor. Now the price is more or less standardized."

ROGER FALEN  
MANNAPRO

and discounts that are passed on by distributors to consumers."

Williams notes that most systems currently in place to handle price administration were not designed to handle anything more than simple cost-of-production plus profit margin calculations. As a result, many organizations become enmeshed in an "accounting nightmare" when they attempt to keep track of an expanding variety of prices and deals relating to individual products.

Another problem, according to Williams, is that various studies have shown that only between 20% to 50% of the special price deals that companies strike ever turn out to be profitable. But because most systems are unable to keep track of the financial consequences of deals, few companies know which are profitable and which are not.

Recently, Andersen introduced DCS/Logistics Extended Pricing software to manage complex pricing structures.

#### Beyond patching

One of the first organizations to use Extended Pricing is a Colorado-based consumer products company, which asked not to be named. According to the company's IS manager, the firm's original order-entry system was created about 10 years ago "when times were simpler." This system was able to accommodate periodic price changes, and each distributor could be assigned a discount schedule.

What the system couldn't do without

## "Our ISI printers are solving problems the IBM printers couldn't."

*"Our requisition form could choke an ordinary printer. It's six-parts thick, with peel-off labels on the top sheet. Yet it's no problem for our ISI printers."*

*"Right now we use Programmed Symbols to produce graphics, but when we upgrade to IPDS, we won't have to change printers. Our ISI printer supports both."*

*"We just brought up our first bar code system. ISI's printers have bar coding ability built in, so we didn't have to invest in special software or custom programming."*

*"Between mainframe jobs, we use our ISI printer for PC printing. Its dual coaxial and serial ports make it a true multi-host printing resource."*

Unlike other plug-compatible manufacturers (PCMs), we do not build terminals, drives, or keyboards. Only printers. Our engineers work on nothing else. They combine over 150 years of experience in producing plug-compatible printers for IBM mainframe and mid-range system users.

This focus enables us to respond quickly to changes in IBM technology, while building into our printers the advanced output and paper-handling capabilities that IBM and other manufacturers simply don't deliver.

Our printers are shop-floor rugged, yet office-friendly. Simple loading and operations make them easy to use for anyone. And since they connect directly to your IBM systems, you don't have the mess of boards, boxes, or other gadgets.



**Interface Systems, Inc.**  
Printer Solutions for IBM Systems

With Interface Systems, you get proven reliability. Since 1975, we've manufactured plug-compatible printers for thousands of IBM 3270, S/3X, and AS/400 users. Each model is backed by complete documentation, service, and technical support.

You also get PCM economy. Our printers cost much less than corresponding IBM models...extra features and all.

To learn more, call us today at 1-800-544-4072. Or write to us at 5855 Interface Drive, Ann Arbor, Michigan 48103. FAX: 313/769-1047.

**Government agencies -- ask about our GSA prices!**

*Hannover, Germany, 1990: European experts judging at CeBIT, the world's largest computer exposition, give their top design award to the Wyse PC Model 3225.*

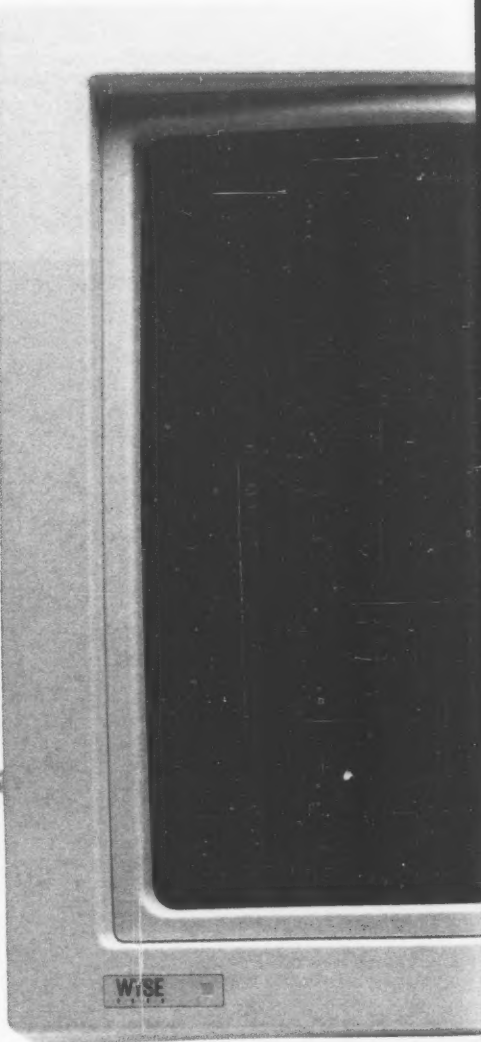
■ No big surprise. Wyse design has been winning over computer professionals for nearly a decade. It's won, in fact, an installed base of more than 3,000,000 terminals and PCs. ■ Because Wyse design is also a wise investment. It delivers more features, styling and ergonomics than the competition. For less money. Witness, for example, the Wyse family of Novell-certified personal computers. ■ The CeBIT award winner, our Model 3225, is a 25 MHz 386

that gives you more MIPS for your money

**THE WORLD IS GETTING WYSE.**

than Compaq's DeskPro 386/25 or IBM's PS/2 Model 70. It's very likely the most cost effective server or CAD/CAM workstation you'll find anywhere. ■ Likewise, our 3016SX at 16 MHz outperforms Compaq's DeskPro 386S and IBM's PS/2 Model 55. Expandable to 16MB of RAM, it's the best SX value around for the demanding user. ■ For entry level users who plan to grow, our Model 2012i at 12 MHz 286 desktop offers 7 expansion slots, 4 drive bays, and up to 16MB RAM. It's the most expandable PC in its price range. ■ All these Wyse systems include MS-DOS 3.3 at no extra charge. To learn more about their winning ways, call 1-800-438-9973.

**Ten of Europe's toughest critics awarded  
Wyse their top prize.  
Over 3 million even tougher critics  
awarded us their business.**

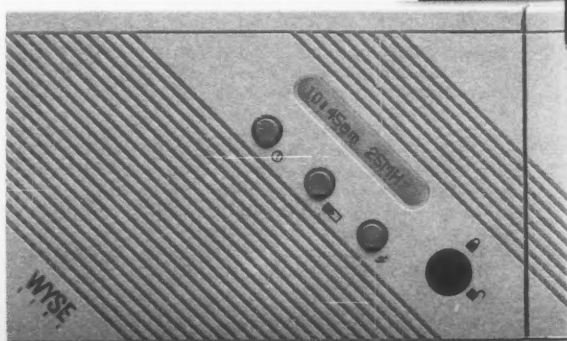


**WYSE**

**1 800 GET WYSE**

*The Wyse Novell-certified PC family, led by our CeBIT award-winning Model 3225. Wyse PCs are among the smartest investments any business can make today.*

WYSE is a registered trademark and Models 2012i, 3016SX, and 3225 are trademarks of Wyse Technology Inc. All other trademarks are property of their respective owners. © 1990, Wyse Technology Inc.



# IN DEPTH

## Creativity in IS

*Even though many techies consider themselves artists, there's still lots to learn about IS innovation*

BY J. DANIEL COUGER

**D**uring the past year, there has been a huge leap in interest about creativity and innovation in business and industry. Numerous business and government leaders emphasize the fact that the U.S. needs a drastic infusion of creativity to regain its economic stature as a world leader. As a recent *Business Week* series concluded: "We are clearly not as competitive as we once were . . . Americans are losing the ability to innovate."

Is there a similar push for creativity and innovation in IS? Sadly, no. In the 35-year history of the IS field, there have only been five articles published concerning creativity in IS. In the few cases in which IS is using creativity techniques, they are being used incorrectly.

Contrary to the widely held view that structure stifles creativity, outside of IS it's clear that there are processes for generating and enhancing creativity that can be taught and learned. Because IS literature provides little evidence to prove or disprove this belief, IS must look to other disciplines: science, art, prose, education, engineering and psychology. In each of those fields, there is clear evidence to support the notion that creativity can be taught to IS workers and used to enhance system design and other IS projects.

### Why IS needs creativity

The computer field is one of the few areas in which the U.S. is still the world leader — a testament to past creativity. Retaining leadership will require even more creativity in the future.

Couger is a professor of information systems and management science at the University of Colorado in Colorado Springs and head of the school's center for research on creativity.

The same logic applies to individual companies: Easy applications have been computerized, while the tough ones lie ahead. IS needs to come up with creative designs for those applications. Domestic and foreign competition is increasing, and companies need to think of new ways to use systems to head off rivals and exploit market niches.

Less than 20 years ago, most Americans viewed the Japanese as far less creative than themselves. They saw Japan as confined more to copying and improving on other nation's products and processes. Judging by Japan's number of new patents at the time, that was true.

It is no longer the case.

A study by the National Science Foundation revealed that in 1987, foreigners obtained 47% of U.S. patents, up from 34% in 1977. The Japanese led with 17,288 patents

— 19% of all U.S. patents — a 25% increase over 1986. In 1987, West Germany acquired 8,030 U.S. patents, up 15% from the prior year. France received 2,990, up 19%. For the first time, the top three recipients of U.S. patents were Japanese firms: Canon U.S.A., Inc., Hitachi America Ltd. and Toshiba America, Inc. General Electric Co., which had held the top spot for 25 years, fell to fourth place.

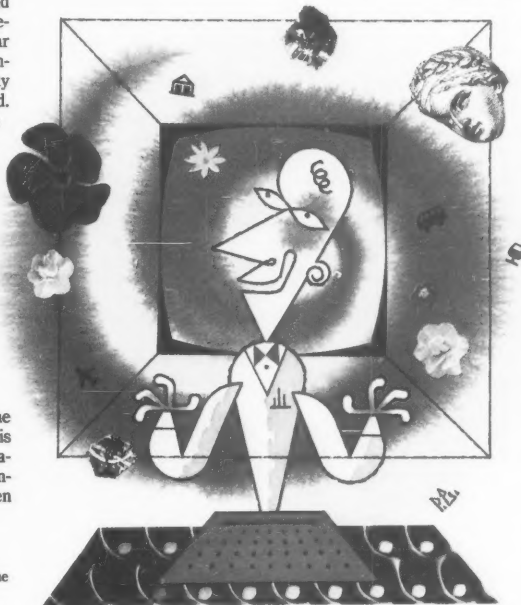
NSF also evaluated the quality of patents. The standard measure of quality is how often the patents are cited; when a patent is noted frequently, it has had a significant impact on subsequent research. In citations, Japanese inventors scored 26% higher than their American counterparts.

In a 1988 study, the National Research Council warned that the U.S. "is already a follower — or worse, an observer — in the development of many of the commercial products of the field." Stakes will be even higher in the 1990s.

IS management can begin by establishing a positive environment for creativity and then following up with training for subordinates on the use of specific creativity enhancement techniques. Placing more emphasis on creative solutions will not result in an exorbitant cost. On the contrary: Applications built by such staff can produce a significant return on investment for their companies.

Initially, creativity techniques can substantially improve the IS design process. However, creativity approaches are useful and necessary throughout the IS organization, from strategic planning to maintenance programming.

Creativity techniques used in IS are implicit. IS management assumes that people will approach all of their tasks



Philip Anderson

- Historically, a dearth of thought
- Twenty techniques can help
- A way to halt U.S. slide?



creatively. In other words, when managers hire, they try to get the most qualified people available. It's assumed that intelligent people will try to find creative ways to perform assigned tasks. That assumption is partially true.

Yet managers cannot be assured that the most creative approaches have been used if employees have not been taught creativity enhancement techniques. Thus, IS needs to move the objective of creative approaches from an implicit to an explicit one.

Few IS users (clients) are fully aware of what the computer system can do for them. Even in this era of accelerating computer knowledge among clients, few have in-depth understanding of computer capability. IS is in a better position than clients to evaluate how the computer might be more useful.

Thus, IS needs to guide clients into a statement of requirements for systems that are more capable and more intelligent than they knew possible. To do so requires system designers to be more creative than merely responding to the initial set of requirements.

If information systems staff members do not use creativity techniques, they tend to rely on approaches that proved satisfactory in the past. As Abraham Maslow said: "If the only tool you have is a hammer, you tend to see every problem as a nail."

#### Creativity gone wrong

More than 20 techniques have been identified that can be useful in IS for generating creativity. Unfortunately, the IS field has used only two techniques, according to the literature available in the field, and these two are generally not being used correctly.

## The Five W's and H

*This creativity technique can drive systems applications*

A creativity technique, referred to as the "5 W's and the H," is quite useful for deriving systems applications. The technique asks "who, where, why, when, what and how" to ensure that all alternatives are considered. Using the 5W/H technique, IS managers can analyze their portfolio of applications and ask the following questions:

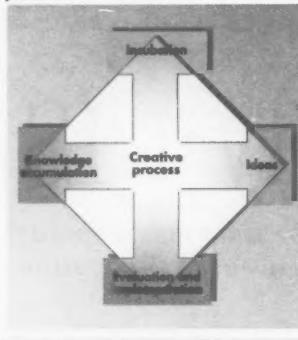
1. How might an application be used for other purposes? Could it be used not just to support internal clients but company customers as well?
  2. Why would we want to provide the service to our customers? How can it provide us a competitive advantage?
  3. Who could best use it? Which customer category?
  4. Where could it be used? Customer management, customer purchasing agents, customer accounting?
  5. What is necessary to reorient the application to this new purpose?
  6. When would it best be installed to provide optimal competitive advantage?
- The 5 W's and the H technique can also be used at key points in the system development cycle to ensure that creative approaches have been utilized. An example is the review of the logical design. The designers can ask the following:
1. Where in the system can we embed more intelligence to make sure that the right decision is made?
  2. How can we enhance the system to improve its reliability?
  3. How do we make sure the system is robust?
  4. What areas of the system can be redesigned to produce information that is more timely?
  5. Who are other possible managers who could make use of the information produced by the system?
  6. Why have we narrowed the design alternatives to the one used here? What are the other approaches that we should consider?
  7. What characteristics of the system are weak? Where is it likely to fail?
  8. When will the client be accessing this system? How are we ensuring proper response times for peak periods?

The same 5W/H technique can be used with different questions at other review points in the development process: physical design review, program design review and test design review. It is also useful in cost/benefit analysis.

J. DANIEL COUGER

#### The creative diamond

*Four distinct stages make up the creative process*



Source: The Center for Research on Creativity  
CW Chart: Paul Mock

Brainstorming is the most widely used idea-generation technique in the IS field. It was developed by Alex Osborn in the 1960s. Almost everyone in IS has participated in brainstorming activities. Nevertheless, a review of psychology literature identifies a number of experiments that prove that individuals produce more ideas alone than through brainstorming in small face-to-face groups.

The main reason for this is that groups inhibit idea generation for many participants. Many individuals find it difficult to express true feelings without fear of social disapproval or the effects of authority hierarchy.

The Nominal Group Technique (NGT) uses the positive features of both brainstorming and brainwriting. There is a silent generation of ideas in writing, round-

robin recording of ideas, serial discussion for clarification, then subsequent rounds of writing. Using this approach, the inhibiting factors of both brainstorming and brainwriting are reduced while retaining public sharing of ideas to stimulate new ideas.

#### Quick techniques

A number of creativity techniques can be brought to the IS field from other disciplines.

Techniques for groups include the following: 5 W's and the H (see story at left), assumption reversals, bionics, circumrelation, metaphors, relational algorithms and symbolic representations.

Techniques for individuals include the following: Nominal group technique, component detailing, force fit, sculptures, stimulus analysis, synectics and systematized directed induction.

A particularly helpful creativity technique has been devised by Edward DeBono, the British author of more than 30 books, and a well-known creative luminary. DeBono's "Six Thinking Hats" technique is used by Nippon Telephone and Telegraph as well as many other corporations.

In the Six Hat system, people in a group discussion actually put on different hats that represent different modes of thinking. It's a convenient way to switch thinking without offending anyone. It works like this:

The white hat represents information and data.

The red hat legitimizes feelings, intuition and hunches without the need for justification.

The black hat is the logical negative: why something won't work.

The yellow hat is the logical positive that talks about benefits, feasibility, etc.

The green hat is the creative hat, which allows someone to ask for creativity.

The blue hat is the process control hat that thinks about and plans the thinking itself.

Another simple but powerful technique for creative decision-making is PMI. In this approach, the Plus, Minus and Interesting points of a decision are listed in separate columns.

Simple devices such as these can help a corporation bring about gradual change while immediately improving creativity.

#### Future at stake

Creativity in system design can be enhanced significantly while increasing the cost of system development less than one-half of one percent. This is known as the "half-cent guideline."

British historian Arnold Toynbee commented on the necessity of creativity more than 50 years ago: "To give a fair chance to creativity is a matter of life and death for any society." There is little evidence that management in the IS field has given a fair chance to the use of creativity techniques. IS needs to do so to exploit the potential of the computer for aiding companies to face the life-and-death situation inherent in present-day competition.

In this era of cost-cutting, management is hesitant to try new things unless it is confident of the cost-effectiveness of a new approach. The potential for improvement of system design by enhancing the creativity of designers is significant.

With such a low threshold in cost to explore more creative approaches, there is little reason not to proceed. •

## Just what is creativity, anyway?

More than one hundred definitions of creativity are recorded in the literature outside IS. Creativity is often defined by use of synonyms — for example, "productive thinking," "divergent thinking," "originality," "imagination" and "lateral thinking."

A practical definition — one that should convince IS managers of the viability of the subject — is the following: "Creativity is a process that solves a problem in an original and useful way." The elements of uniqueness of solution and value of results are both essential in the definition.

P. R. Nayak and J. M. Ketteringham, in their book, *Breakthroughs*, document 13 cases of creativity and innovation. "In every case," they say, "... it was the curiosity within the originating person that lit the fire. Neither financial need nor market intelligence played a major role in these exceptional beginnings ... it always was a problem to be solved, not a fortune to be made, not a market to be exploited."

Review of the breakthroughs described by Nayak and Ketteringham reveals three things in common in all 13 cases:

- Investigators expected a creative idea to occur, then went into the experiment with a confident attitude.

- They used a methodical process to reach the result. It was not a product of chance or inspiration but rather one of systematic investigation.

- A period of incubation was needed to put the ideas into "secondary memory" to let the subconscious work on them.

More formally, the process of creativity is considered to have four stages: preparation, incubation, illumination and verification. Although several variations of depicting this process exist in the literature, they are essentially the same (see chart above). A similar process can help to ensure creativity in an IS organization.

There may be a lengthy period between stages. An example of the gap between discovery and use is illustrated by the invention of the Swiss chemist, George Adenman, who discovered cellulosic materials. Almost 50 years elapsed before any practical use occurred with artificial silk, under the name of rayon, by Comte Hilaire de Chardonnet. Fortunately, in IS, there are much shorter periods between the stages.

J. DANIEL COUGER



# Technical problems, creative solutions

*Corporate creativity programs use innovative methods to pull usable ideas out of fishing talk*

BY JANET MASON

**W**hat do juggling, classical music and fishing trips have to do with information systems problems? The answer could be nothing — or everything.

At GE Aerospace Computer Services in Valley Forge, Pa., for example, IS managers trying to decide whether to swap an NCR telecommunications front-end processor for IBM equipment loosen their imaginations by talking about fishing trips and their ideal vacations.

At Du Pont Co., vice-presidents stand alongside new hires in seminars and take "brain breaks" by juggling and listening to classical music.

While skeptics scoff at such tactics, creativity converts say the approaches can yield novel solutions for everything from network debugging to training employees in new technologies.

And, they add, with increased competitive pressures and the need to cut costs and do more with fewer employees, creativity programs make even more sense, even in the short term. AT&T and Du Pont say their creativity programs have cut training time in half.

"Business can no longer pay the expense of useless, long training sessions," says Charles Martinetz, director of corporate education and training at AT&T's training division in Hopewell, N.J., justifying his company's creativity-enhancing offerings.

## Right brain gain

Although creativity programs are offered to many different professionals, they hold special appeal for computer personnel. "IS people can relate to the way their brains work and how to improve their thinking because they see the connection between their minds and computers," says Bill Abrams, who is principal consultant at GE Consulting Services, Inc., in Cherry Hill, N.J., and teaches creativity to General Electric employees.

IS employees also benefit from such programs, Abrams and others say, because they traditionally are rewarded for using their "left" brains, which contain the logic necessary to understand technology. By learning how to use their intuitive "right" brains, Abrams explains, IS professionals can integrate their logic with creativity, which enhances problem-solving.

Paul Jordon, director of training and education at GE Consulting Services Corp., which provides computer training to GE divisions and other companies, says Abrams' creativity and reading improvement seminar enables him to better absorb and spend less time staying abreast of "information on the latest and greatest computer products."

Creativity programs have different labels and methods. GE's program, called "Mind Management," offers a day-long seminar that explains how the brain works and how brain power can be enhanced. The company also uses outside consultants in brainstorming techniques

for specific problems called Synetics. Du Pont uses customized training from an outside consultant. At AT&T, accelerated learning techniques enhance employee training programs.

The underlying principles of many creativity programs are the same, however. By using both the left and right hemispheres of the brain, says Michael Gelb, president of Washington, D.C.-based High Performance Learning, employees can change their mind-sets from doing what they have always done to looking at the broader picture.

The technique uses rhyming and images to enable employees to make associations with words and images, such as "one, bun and two, shoe." To remember a third word in each series, the employee visualizes a bun or a shoe next to the additional piece of information, such as a feather sticking out of a bun.

"This reinforces a positive attitude because when employees first try to memorize 10 items, they only remember about one-third of the list. After learning the technique, however, they remember all 10 items," Gelb says.

Walter Marz, who leads the Synetics sessions, instills confidence by starting his sessions on a positive note. "We start out with 'I wish' and 'How to' statements where participants say what they need to solve the problem," says the Kendall Park, N.J.-based consultant. "When people approach a problem by saying 'we can't do this,' it becomes a self-fulfilling prophecy."

**I**S PEOPLE CAN relate to the way their brains work and how to improve their thinking because they see the connection between their minds and computers."

BILL ABRAMS  
GE CONSULTING SERVICES

GE's day-long Mind Management seminar is distilled from a three-day video-based course called "Becoming an Everyday Genius," based on the work of Gelb and Tony Buzan, a Marlow Bucks, England-based creativity trainer. Although the Genius program was used to train employees in how to use of personal computers, the Mind Management seminar is taught to employees in a variety of functions throughout GE.

Abrams estimates that he teaches 100 to 300 employees per year in the various GE divisions that contract his services.

A popular technique in the program is called mind-mapping, a process of organizing and taking notes. The person making the map uses colored markers to draw a central image in the middle of a page with branches stemming out from the image to related images and written ideas. The theory is that this process of taking



Creativity consultant Gelb: "We start out with 'I wish'"

notes mirrors the way the brain makes associations.

"I use mind maps to plan everything," says Dan Ladik, lead analyst for datacom support at GE Aerospace. Along with using them to plan memos and do strategic planning, Ladik also uses mind maps to solve data communications problems.

"I put the components on the mind map, the chain of multiple vendors, and then draw lines to show how they interrelate back to the main processor," Ladik says. The mind map helps him figure out which pieces of the network "effect the transfer of data."

Using a mind map, he adds, is like using a random-access disk: "The map starts in the center, and the connections move out from there. Like a random-access disk, it gets you where you want to go faster."

## Learning is fun-damental

Gelb teaches that learning can be fun. To demonstrate this, he teaches corporate employees how to juggle.

Juggling, which involves rhythmic coordination of the right and left side of the body, "is an ideal brain break that mirrors the effect of sleeping on a problem," Gelb explains.

It is also something that everyone can do together. "It's a great leveler," Gelb says. "Everyone from the vice-president to new hires will be dropping balls together as they learn how to juggle."

Well-seasoned juggler and IS consultant Tom Jenkins first learned to juggle while taking a seminar at Du Pont. "We had a problem because it took too long to train our end users, and they weren't retaining the information," he recalls. His

division was training users of Du Pont's Automatic Clinical Analyzer, which was marketed to hospitals and used by technicians.

By using "brain breaks" for 10 minutes each hour, such as juggling and having the users listen to classical music, Jenkins says, the users found they could retain more information.

"Everyone thinks you have to be exhausted to be working," says Jenkins, who was previously manager of learning resources at Du Pont clinical systems. "But by taking a break and having fun, your brain has a chance to really absorb the information."

Creativity techniques were part of the plan to switch training from instructors to students using computer- and video-based materials. The result of the entire program was that Du Pont cut its training time in half, cut its training staff by a third and increased the number of users it trained by 50%.

Brain breaks and mind mapping are also used as part of AT&T's accelerated learning programs. Employees in these programs learn subjects and techniques all at once.

AT&T uses the techniques to train employees in a variety of disciplines such as learning foreign languages and new skills.

"The information stays in their minds longer because it is based on images," explains Martinetz, who has a doctorate in educational psychology. He notes that research proves that rote memorization only stays in people's minds for a short time.

## Marbles and bits

"When teaching employees about data streams, we illustrate the process by blowing black and white marbles representing bits and bytes through a clear tube," says Martinetz, who consults with AT&T trainers on incorporating accelerated learning techniques into their training programs.

Imagery also plays a large part in the Synetics training. Marz leads problem-solving groups using what he calls "side trips," where the participants discuss seemingly unrelated issues.

"We could be discussing a networking problem," Marz says, "and then we will take a break and think about images from the natural world. Someone might use the image of a lion and then see how the lion's attributes can be used to solve the network problem."

"Each person has a database in their mind," Marz says. "And the solution to the problem lies in the collective database of employees who are participating." The side trips, which get the employees thinking with their right brains, help stimulate people into coming up with new solutions, he says. ■

Mason is a free-lance writer living in Philadelphia.



# Is your fractional T-1

**Only AT&T ACCUNET®  
Spectrum of Digital Services  
offers you the exact capacity  
and bandwidth you need  
to more than 500 locations nationwide.**

Choose AT&T as your fractional T-1 vendor and you won't be locked into a network that limits your options. Because with more than 500 locations nationwide, AT&T's ACCUNET Spectrum of Digital Services (ASDS) gives you the freedom to send voice, data and images to more locations than anyone else.

And that's not the only way you benefit from ASDS' extensive network. Along with more locations, we also have many more back-up routes.\* Which means ASDS can also provide protection for your critical applications like no one else.

For most businesses ASDS' extensive network translates into lower access charges, too. That's because we're closer to more customers than our competitors.

You won't find an easier service to hook into, either. Whether you have Analog Voice Grade Private Line, ACCUNET T1.5 or single channel digital access at 96 or

\* available through our diversity options.



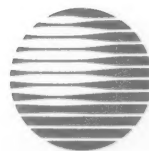
# network too confining?

56 kbps, getting access to ASDS couldn't be simpler.

So if you're feeling cramped by your network's reach, give us a call. We've got just the thing to break you out.

*Service.  
Another AT&T advantage.*

For more information on AT&T's ACCUNET Spectrum of Digital Services, call your AT&T Account Executive or 1800 247-1212, Ext. 107.



**AT&T**

The right choice.



# IS 'intrapreneurs' hold key to open doors to innovation

BY AVERY CLOUD

Information technology is a neutral force in and of itself. It only becomes a potent force when creative people find ways to use it in innovative ways. Information systems professionals with the proclivity to innovate are becoming extremely valuable assets.

IS professionals with entrepreneurial spirits are leading the way for companies that use information technology as a competitive weapon. An entrepreneur is someone who creates a new product, service or process outside of the confines of established business enterprises. But companies also need internal innovators.

In a recent work by authors Tom Peters and Gifford Pinchot, this internal innovator is called an "intrapreneur," someone who develops a new product, service or process within an existing organization.

Intrapreneurs are needed in the ranks of IS professionals. Also needed is enlightened IS management that knows how to foster an environment in which intrapreneurship thrives.

In today's competitive marketplace, innovation has become a critical factor. Peter Drucker, an authority on business philosophy, puts it this way: "The enterprise that does not innovate inevitably ages and declines. And in a period of rapid change such as the present, an entrepreneurial period, the decline will be fast."

Nowhere are changes coming faster than in the field of IS, and in no other field will innovation yield more competitive advantages than in IS. However, innovation only thrives in an environment that cultivates and accepts new ideas. Drucker says that entrepreneurial management requires policies and practices in the following four areas:

- The organization must be made receptive to innovation and willing to perceive change as an opportunity, not a threat.
- Systematic measurement, or at least appraisal of a company's performance as entrepreneur and innovator, is mandatory.
- Entrepreneurial practices pertain to organizational structure, staffing, managing, compensation, incentives and rewards.
- There are some things that shouldn't be done in entrepreneurial management. Good innovations are not necessarily totally new things conjured up from the scientific abyss. They are often the result of combining known methods or materials in a new way. Here are some tips on how to foster intrapreneurship:

**Educate.** Training and education are important in the intrapreneurial environment. For example, it is not likely that IS professionals will come up with an innovative way to use optical discs if they know nothing about them. Seminars, classes and trade journals are invaluable.

**Reward.** A reward system should motivate employees to innovate. Rewards

should be a mixture of recognition and money.

**Encourage risk-taking.** Managers should encourage experimentation and risk-taking and allow failure. When employees are burned at the stake for making mistakes, they will likely always choose the safe route and do only what they are told.

**Welcome input.** Managers must allow and encourage input in the decision-making process from all levels. How many opportunity dollars have been lost because an employee kept a good idea to himself, thinking his superiors didn't care to hear it?

**Study new technology.** Special committees, task forces and departments should be established to study and test new technologies. Write up the results of these tests well, including suggestions on how the product might be used in your company.

Consistent and powerful innovations are not just the product of chance. A little luck doesn't hurt, but organizations that are not structured to allow innovation usually won't achieve it. Creating and enforcing policies and practices to foster the intrapreneurial environment is the only way to acquire the holy grail of innovativeness.

Cloud is manager of technical services in the information services department at Bowman Gray/Baptist Hospital in Winston-Salem, N.C.

## DOS, OS, or CICS Frustration? BIM gets it out of your system.

BIM presents a line of proven programs that maximize your system's capabilities, saving you time, labor and expense. These program products help get the most out of your system and people.

**BIM-VIO** — DOS/VSE Virtual Disk Drive. Moves the Standard Label Area directly into memory and allows for other heavily used non-permanent files to be moved into memory as well.

**BIM-VSUM** — Provides powerful design, monitoring and tuning capabilities for MVS VSAM catalogs and data sets. BIM-VSUM can be executed in either TSO/ISPF mode or batch.

**BIM-WINDOW** — Multiple terminal sessions concurrently at CRT under DOS or OS VTAM.

**BIM-EDIT/DOS** — The most powerful, flexible full screen editor available for DOS/VSE.

**BIM-EDIT/MVS** — All of the features of our popular DOS editor and does not require the overhead of TSO. Can be accessed directly from VTAM or from CICS or other terminal subsystems.

**BIM-SPOOL** — Prints output in POWERVSE spooling queue on local or remote 3270 terminal printers. (Received ICP Million Dollar Award 1982).

**BIM-SPLSR** — Optional laser printer support for BIM-SPOOL.

**BIM-SPOOL** — On-Line to Batch Print Spooling. Prints data passed from CICS application programs into the POWER spooling queue.

**BIM-SPLIT** — May be used separately or with BIM-SPOOL to print parts of an existing job to terminal printers at separate sites.

**BIM-PDQ** — POWER Dynamic Queuing performance enhancement. Eliminates 85% of the I/O to heavily used POWER queue.

**BIM-PADS** — Automatically alters or deletes DOS POWER spooled job entries at preset intervals.

**BIM-ODIS** — Comprehensive problem analysis and display of operational CICS system. ODISRAK is an optional historical reporting feature to be used with BIM-ODIS to generate reports relating to system usage. DOS and OS.

**BIM-BUFF** — Significantly increases the performance of VSAM under DOS by dynamically managing VSAM buffers.

**BIM-PACK** — Automatically compresses selected VSAM files transparent to applications and end users under DOS.

**BIM-TEXT** — Word processing, document composition system. Create formatted documents from free-form input. DOS and OS.

**BIM-SWAP** — Switch local 3270 BTAM terminals between multiple CICS partitions without special hardware or additional ports.

**BIM-CMPRS** — CICS 3270 data compression system. Reduces response time for remote terminals significantly. DOS and OS.

**BIM-FMAP** — CICS BMS on-line map generation and maintenance. DOS and OS.

**BIM-CHO** — Copies one CRT's output to another or printer for problem determination and demonstration. DOS and OS.

**BIM-P3270** — Comprehensive CRT screen image print facility. Copy to terminal printers or spool queue for system printer. DOS and OS.

**BIM-SERV** — On-line display of library directories and entries, VSAM Catalog entries, disk VTOC's, etc.

**BIM-CONSOL** — Multiple/Remote System Console function for CICS. Display-only or full input/display versions available.

**BIM-MONTR** — DOS/VSE System Status, Performance Measurement, and POWER Queue display.

**BIM-SUBMIT** — On-line Job Edit and Submission facility.

BIM programs are cost-efficient, some less than \$800, average \$2500. You can save even more with our group package offerings. Products are available on permanent, annual, or monthly licenses, and shipped on a 30-day free trial basis. Product documentation is available on request.

BIM also performs systems programming consulting, with consultants based in Minneapolis and Washington, D.C. Computer time services are also available on our 4361-5 system, on-site or remote.

**BIM** B I MOYLE ASSOCIATES, INC. 612-933-2885  
5788 Lincoln Drive Fax (612) 933-7764  
Minneapolis, MN 55436 Member Independent Computer Consultants Assn.

## Creative writing

The following is a starter reading list for cultivating creativity, provided by Phyllis S. Kramer, a partner at Engineered Software in Alhambra, Calif.:

Adams, James. *Conceptual Blockbusting*

Anderson, Harold. *Creativity and Its Cultivation (Selected Writings)*

Arieti, Silvano. *Creativity: The Magic Synthesis*

Bacon, Donald. "Brainstorming With Your Computer," (an evaluation of Ideafisher software) in *Nation's Business*, Vol. 77, December 1989.

Barron, Frank. *Creativity and Health*

Buzan, Tony. *Use Both Sides of Your Brain*

Capaccione, Lucia. *The Power of the Other Hand*

DeBono, Edward. *Lateral Thinking: A Textbook of Creativity: DeBono's Thinking Course*

Dormen, L.; Edidin, P.; Roberts, M. "Original Spin: Creativity is Not Just for Geniuses and Artists," *Psychology Today*, Vol. 23, July-August 1989.

Edwards, Betty. *Drawing on the Artist Within; Drawing on the Right Side of the Brain*

Garfield, Patricia. *Creative Dreaming*

Gawain, Shakti. *Creative Visualization*

Keil, John. *How to Zig in a Zagging World; The Creative Mystique*

Koestler, Arthur. *The Act of Creation*

Kreigel, M. and Krieger, R. "How to Master Back-Burner Thinking," *Working Woman*, Vol. 13, January 1988.

LeBoeuf, Michael. *Imagining*

Madigan, Carol and Elwood, Ann. *Brainstorms and Thunderbolts*

McLeish, John. *The Ulyssean Adult (Creativity in the Middle and Later Years)*

Mooney, Ross and Razik, Taher. *Explorations in Creativity*

Ornstein, Robert. *The Psychology of Consciousness*

Osborn, Alexander. *Applied Imagination*

Springer, Sally and Deutsch, George. *Left Brain, Right Brain*

Stein, Morris. *Creativity and The Individual (Selected Writings)*

Von Oech, Roger. *A Kick in the Seat of the Pants; A Whack on the Side of the Head*

Weisburd, Stefi. "The Spark: Personal Testimonies of Creativity," *Science News*, Vol. 132, November 7, 1987.



# COMPUTER INDUSTRY

## NATIONAL BRIEFS

### Italian sub

**Dell Computer Corp.** finally claimed its place last week as the first direct marketing personal computer company in the Italian market. The newly opened **Dell Italy**, which is subsidiary No. 6 for the Austin, Texas-based PC vendor, will be headed up by industry veteran **Enzo Urbani**, who is the former area general manager at Ing. C. Olivetti & Co. What's more, Dell Italy's products will come forth from Dell's other late-October entry: a manufacturing plant in Limerick, Ireland, that is positioned to gain tax and duty advantages for Dell as well as to supply the company's European subsidiaries.

### Son of Aldus

**Axon Corp.**, which plans to deliver Microsoft Corp.'s Windows 3.0-based business graphics software applications to the personal computer market, made its official corporate debut in Seattle last week. For the company's founders, however, the start-up trail is familiar territory. **Jeremy Jaech** and **Dave Walter** were also co-founders of **Aldus Corp.**, while third Axon founder **Ted Johnson** helped to spearhead the development of Aldus' crown jewel offering: the Pagemaker desktop publishing software package.

### How do you say . . . ?

What is this rumor that Dutch electronics firm **Philips N.V.** is joining **MCC**? It's true enough, but the **MCC** that Philips is teaming up with is not the consortium located in Texas — it's the company in Tennessee. Knoxville-based **Maxwell Communications Corp.** **PLC** and Philips are forming a joint venture to launch a multimedia publishing company that will bring the well-known Berlitz method of speedy language instruction to the home, school and office via interactive compact disc.

## High hopes for home PC market

*Despite best-forgotten forays into home market, PC vendors say this time they'll do it*

BY MICHAEL ALEXANDER  
CW STAFF

**R**emember Adam? When Coleco Industries, Inc. introduced Adam in January 1985, the company crowed that its home computer would one day be as popular as the television set. Adam went off to technology's trash heap, but the allure of a home computer market remained.

Today, despite the industry's notable flops, IBM, Tandy Corp. and Apple Computer, Inc., among others, are making another run at the home market. What is different this time around is that the computers are easier to use, and consumers are more comfortable with the technology, the vendors said.

According to several market researchers, however, the emergence of a home market may owe more to the growing popularity of home businesses than to any other reason.

### Do your homework

Link Resources has calculated that 26.8 million Americans work at home at least part time. More than 35% of those home worker households — compared with 22% of all U.S. households — have personal computers, Link researchers said.

Millions of consumers are also buying home computers to continue working at home either to get ahead or to be able to leave the office at 5 p.m., spend time with the family and then complete the day's work in the evening.

There are actually two home markets: the work-at-home market and the "home task" market, said Ed Juge, Tandy's director of market planning. Tandy, which has been selling computers to the home market for 10 years, has the largest share of the installed base of home computers — approxi-



Robin McGee

mately 17%, he said.

The work-at-home market is already showing signs of stagnating, Juge said. Computer penetration has been stuck at about 20% of households for the last three or four years, he noted. "People are continuing to buy computers for the home," he said, "but the market is not getting any bigger."

Tandy believes that there is a lucrative market of consumers who want to use a computer at home for everyday tasks but have no inclination to run a home business or shuttle work between office and home. "It's more like a home appliance market," Juge said.

In July, Tandy introduced its Tandy 1000 RL home computer, which lists for \$750 to \$1,299 and offers a slew of built-in programs developed especially to make everyday home tasks easier. There is a Home Information Center program, for example, that includes a bulletin board where family members can pick up and leave messages for

each other. The computer is designed to be on all day — the screen blanks out, and the hard disk shuts off if left idle for five minutes, Juge said. "Sales of the new machine are going well ahead of expectation. There is a market out here, but we don't know just how large it is yet," he said.

"Based on my experience of 11 years in the retail computer field, I put my thumb on my nose and give them a big raspberry," said William Blocher, president of the Bit Bucket computer retail and direct sales outlets in Massachusetts and New Hampshire. Consumers are not interested in keeping recipes or balancing their checkbooks on computers, he said: "The people coming into computers today want a tool at home. They know what they want to use it for, and they have a specific price in mind." PC vendors may be overestimating the long-term potential of the work-at-home market.

*Continued on page 135*

## Compaq reaps rewards of aggressive pricing policy

BY RICHARD PASTORE  
CW STAFF

**C**ompaq Computer Corp.'s recent capitulation to pricing pressures has paid dividends in surprisingly high third-quarter revenue and shipment growth, observers said last week.

Total revenue rose 26% to \$863 million, while net income jumped to \$124 million, a 42% increase over the corresponding quarter last year.

Compaq had no choice but to be more aggressive on pricing, said Benny Lorenzo, an analyst at Volpe, Welty

& Co. in San Francisco. Because of the sluggish U.S. market and mounting competitive pressures, "Compaq's revenue might have been negative in the U.S. without these price cuts," Lorenzo explained.

Since August, Compaq has cut the prices of at least nine personal computer lines as well as options such as memory cards. Grateful customers in turn boosted unit shipments in North America 20% over the corresponding quarter last year. This figure contrasts favorably with an overall North American shipment growth of just 5%.

Typically, price cutting such as

Compaq's has a negative effect on gross margins, analysts noted. However, Compaq's margin for the quarter was above expectation at 43.6%, largely because of lower component costs and improved factory efficiencies, the company said.

However pleasant that surprise, Compaq is taking a cautious attitude regarding future margins and the fourth quarter. "We certainly don't think those levels of growth margin are sustainable in the long term," said Michael Swavely, president of Compaq North America.

Swavely also struck a "cautiously optimistic" chord for the fourth quarter. While product orders for October appear to be meeting or exceeding plans, the specters of U.S. economic problems and the Middle East crisis may yet cast a hex over this year's earnings, he said.

**COMPAQ**

# Oracle resets track to the black

BY JEAN S. BOZMAN  
LW STAFF

REDWOOD CITY, Calif. — Work on Oracle Systems Corp.'s glittering new headquarters complex — halted last month as the high-flying firm pondered the impact of its recent \$36 million quarterly loss [CW, Oct. 1] — is back on track.

And so it is inside the green-glass towers that Oracle executives are still struggling to put their software business in order — and do it quickly. "We're inwardly focused," Oracle Chief Financial Officer Jeffrey Walker said. "We believe that our wounds were self-inflicted, and we're trying to correct what we've done wrong."

To regain profitability and retain its thousands of corporate clients, Oracle is in the midst of a massive restructuring. October has seen the exit of several key executives — some by choice and some by fiat. Now there are three lieutenants at the helm of Chief Executive Officer Lawrence Ellison's ship: Geoffrey Squire, who directs worldwide sales; CFO Walker; and former ADR executive Michael Fields, president of Oracle USA.

All three said that Oracle is taking many steps to strengthen ties with its user base. "Unless you satisfy the users, everything else is a waste of time," said Squire, who is based in London but is currently spending three weeks of every four in California.

"I've got to put it right," he said. "I won't go home until I put it right. This company is my

whole life."

Squire, who has been with the firm since 1981, served as managing director at Oracle UK from 1984 to 1986 and as CEO of Oracle Europe from December 1986, until his appointment as corporate vice-president in charge of worldwide sales this past May. Although his career began in accounting in the late 1960s, he quickly moved into software development and consulting.

"I'm a detail person," Squire said. "I get furious when I see anyone making a detail mistake."

## Need for new attitudes

But "putting it right" means taking Oracle sales through an abrupt cultural change, Squire said. As a measure of cost-consciousness, he said, quarterly quotas are out — and monthly quotas are in. "We'll be closing the books at the end of every month, so we'll know September's results in October rather than in November," Squire said. "In the old system, an Oracle salesman would hold an order in his desk drawer until the end of the quarter, because that's when he got his sales incentives."

Once the sales are made, Oracle must be prepared to follow through with the kind of hand-holding and technical support that some of the more seasoned systems vendors provide. Historically, Oracle was known for its efficient sales activities and marketing — and for an unacceptably high error rate in new software releases, according to

several executives.

"In order for us to achieve the level of [financial] return we expect, large corporations will have to acquire significantly more products from Oracle," Fields said. "We have to earn the right to be there. We can't just be a sales force selling revenue. We've got to [learn how to] be a strategic partner."

Fields, meanwhile, said that he is spending much of his time traveling cross-country to meet with Oracle's largest clients. In key cities, he is holding customer roundtables to get feedback on Oracle's technical support and services.

At the same time, Oracle is beefing up its technical support

staff and considering a 24-hour, seven-day global maintenance service.

Squire contends that far from cutting technical support in the name of budgetary efficiency, Oracle is increasing it. "One of the basic mistakes we made was having inexperienced operators answer those customer calls for technical assistance," he said. "That was a fundamental error. Those calls should have been answered by technicians." Oracle began a "real-time" technical call-in service earlier this month, tracking calls for assistance and speeding resolution of technical problems (see story below).

To regain its footing, Oracle is trying to put the brakes on its once high-flying business, which used to double on a yearly basis, Walker said. Cost-cutting measures, such as consolidating of-

fice space and subletting leased properties, are now in place. Research and development funding will remain constant, Walker said, although it will decrease as a percentage of sales. Hiring is frozen worldwide, with few exceptions.

Oracle's users seem to be responding to the new management statements, although it isn't clear how hopeful they are, said Charles Phillips, a senior analyst at Soundview Financial Group, Inc. in Stamford, Conn. "Users are saying they don't know where else they can go for relational technology, since they have concerns about Oracle's competitors," Phillips said. "Ingres [Corp.] is being acquired by Ask [Computers, Inc.], and Sybase Corp. appears not to have been profitable in recent quarters."

## What's in the works

At Oracle's Oct. 15 stockholder meeting, Chief Executive Officer Lawrence Ellison fielded questions from investors and employees for nearly 90 minutes. He used the occasion to shed light on management changes designed to respond to the firm's financial crisis.

Among the revelations that came to light during Ellison's question and answer session were the following:

- Oracle's new customer-support telephone service is receiving 500 calls per day and, according to Ellison, resolving 600 technical problems daily, reversing a backlog of requests. "We want to start fixing bugs at a predictable rate," Ellison said. "We're selling software with some bugs, but we don't want to have any."
- Oracle Chairman Donald Lucas and Ellison are

spending much of their time scouting for new board members and other senior managers from multibillion-dollar high-tech firms. Executives from overseas corporations are among those being considered.

- Plans to build an additional building at the firm's Redwood City, Calif., headquarters complex have been placed on hold. Meanwhile, the firm is consolidating leased space in 19 office complexes in the area and is subleasing empty space.
- Oracle will not buy back shares of its stock to boost share prices above the current \$6 per share trading level, even though investors have requested that move. "We simply don't have the cash available to buy back our stock," Ellison said.

JEAN S. BOZMAN

## INTERNATIONAL BRIEFS

### Taking care of bidness

Canada's Northern Telecom Ltd. and AT&T said they had no comment on recent speculation that they may be among several potential bidders for UK-based telecommunications group STC PLC. At the top of the list that includes AT&T and Northern Telecom — already a 27% stakeholder in STC — is France's Alcatel N.V., according to London-based analysts; Alcatel has denied that it is holding takeover talks with the British firm.

### Going Dutch

By the end of the year, Philips-Du Pont Optical, currently a 50-50 joint venture between Netherlands-based

Philips N.V. and U.S.-based Du Pont Co., will cease to be a Dutch treat and begin to be more of a Dutch company, the co-owners announced last week. As a result of diverging long-term goals, Philips plans to buy its partner out of the entertainment-oriented consumer activities of the optical disc concern. Meanwhile, the firms seek a third-party buyer for the firm's professional and optical disc mastering activities.

### Finnish lines

State-owned Telecom Finland's development of the European digital cellular telephone network, the Groupe Speciale Mobile (GSM) — a memorandum of understanding for a digital cellular standard signed by European phone companies and telecommunications vendors — is still on track, but with some competition. The

Finnish government recently granted a license to build a GSM network to Oy Radiolinja Ab, a firm co-owned by several financial institutions and phone companies.

### Cap's off

For the first half of 1990, Europe's leading software and computer services group, Cap Gemini Sogeti, reported a slight drop in pre-tax profit, sliding to \$71 million from \$75 million logged in last year's comparable period. Consolidated revenue for the Paris-based firm grew to \$773 million, increased from \$652 million last year. Taking into account its summer acquisitions of UK-based Hoskyns PLC and SCS Scientific Control Systems GmbH, Cap Gemini said it expects to report some \$1.8 billion in total 1990 revenue. If realized, this will mark a 28% revenue jump over last year.

## In the balance

October earnings show more treats than tricks

Company	Revenue July through September 1990	Percent change from 1989	Net income July through September 1990	Percent change from 1989
Ameritech	\$2.7B	4.5%	\$311.2M	7.6%
Ask Computer	\$41.3M	17%	\$11,600	28%
Conner Peripherals	\$380.4M	106%	\$40.6M	244%
Comnet Computer	\$33.3M	2%	\$684	41%
Cray Research	\$186.64M	(11%)	\$27.55M	(10%)
Index Technology	\$10.41M	15%	\$1,050,000	—
Legent Corp.	\$46.5M	33%	\$8.9M	18%
Mastec Corp.	\$22.2M	0%	\$1.6M	(63.7%)
Mips Computer	\$37.5M	38%	\$143,000	(92%)
Seagate	\$48.0M	0%	\$12,000	(60.5%)
Storage Technology <sup>2</sup>	\$265M	14%	\$12.1M	46%
Syrinx	\$100.4M	21%	\$5.7M	12%
Sungard Data	\$62.7M	20%	\$4.8M	2%
Texas Instruments	\$1.18B	7%	(17M)	—

Parentheses indicate a reduction or loss

1) Reflects consolidation with revenue and net income of Mastec Colorado (Miniscribe)

2) Net income excludes an extraordinary gain from purchase of convertible debentures

CW Chart: Paul Mock

# Disk drive survivors emerge

*After shakeout, three U.S. hard disk drive makers are reigning leaders*

BY MAURA J. HARRINGTON  
CW STAFF

MONTEREY, Calif. — The hard disk drive is the computer's equivalent of a kidney: an important organ that is typically ignored until it breaks down.

The multibillion-dollar magnetic hard disk drive market — which includes the 5¼-in., 3½-in. and now 2½-in. magnetic hard disk drives — is one of the few computer industry niches in which the leaders in the field are all U.S.-based companies. And exactly who these leaders are is easier to pinpoint today, in the wake of a small shakeout in the sector during the past year.

As it now stands, the three leading vendors of hard disk drives in terms of market share and revenue are Conner Peripherals, Inc. and Maxtor Corp., both in San Jose, Calif., and Scotts Valley, Calif.-based Seagate Technology, Inc., according to Katherine Hilton, an analyst at market research firm Infocorp, a Gartner Group, Inc. subsidiary based in Santa Clara, Calif. Two of the three solidified

their positions through recent market consolidation.

In June, Maxtor doubled its size and became a \$1 billion company when it bought Miniscribe, Inc. in Longwood, Colo., out of bankruptcy.

Seagate Technology, a leading 5¼-in. disk drive manufacturer, also gained some market share by acquiring Imprimis, Inc., the former disk drive and related technologies subsidiary of Control Data Corp., last October.

These two acquisitions, coupled with the increasing popularity of the 2½-in. hard disk drive — originally developed by Prairietek, Inc., a start-up company located in Mountain View, Calif. — have helped to stabilize the hard drive industry, leaving little room for any more leaders, which analysts said has helped stabilize the worldwide market for U.S. drive manufacturers.

The hard disk drive industry, however, remains fiercely com-

petitive, and while analysts do not predict any major changes of market share leaders in the next couple of years, "nobody in this industry owns anything. You have to run like hell if you're in front and never look behind you," said Jim Porter, president and publisher of Mountain View, Calif.-based Disk/Trend, Inc., an independent newsletter that tracks the hard disk drive industry.

At the moment, Porter said, the hard drive market is healthy, with a good number of manufacturers and several routes to potential

market growth.

In addition to the trend toward higher capacity, smaller size drives, Porter said that demand for the 5¼-in. disk drive — always a big seller on lower capacity computers — is also growing at the 500M-byte and higher capacity level. Approximately 57% of the growing 2½-in. drive market currently belongs to Conner Peripherals,

according to Infocorp.

Overall demand, Hilton said, is sufficient to support not only the boisterous growth of market leaders Conner Peripherals, Maxtor and Seagate, but also "a lot of strong players underneath them, as well as the nonindependent players like NEC Corp. of Japan and IBM here." She added that both Prairietek and Quantum Corp. in Milpitas, Calif., although comparatively small in size, are also considered "healthy" independents.

Conner Peripherals, a multi-

smaller form-factor drives within the next month," she added. Indeed, Conner Peripherals announced a new series of 2½-in. and 3½-in. hard disk drives last week.

The new 2½-in. drives feature an average seek time of 19 msec and include drives in 32M bytes, 42M bytes and 64M bytes of formatted storage in a ¾-in.-high package, according to the company.

Quantum also introduced a new drive this month called the Prodrive LPS, a 105M-byte,

**N**OBODY IN THIS industry owns anything. You have to run like hell if you're in front and never look behind you."

JIM PORTER  
DISK/TREND

billion-dollar company, owns the highest percentage of market share, followed by Prairietek with 30%, according to Infocorp.

"The industry is clearly moving toward smaller, higher capacity hard drives, particularly those made for the notebook-size computers," Hilton said.

"We expect several new announcements of higher capacity,

3½-in. formatted drive with an embedded small computer systems interface controller in a 1-in. high form factor, according to the company.

A spokeswoman for Maxtor said that it, too, is preparing to roll out a new line of 3½-in. drives soon, including 100M-byte, 200M-byte and 535M-byte drives.

THE VISION TO SEE YOUR NETWORKING NEEDS CLEARLY.  
THE KNOWLEDGE TO PROVIDE THE SOLUTION.  
THE EXPERIENCE TO MAKE IT WORK. ANYWHERE IN THE WORLD.



We're Harris Adacom, one of the world's leading networking experts and an international manufacturer of networking and data communications products. With over 200 offices worldwide, we're capable of providing you with networking solutions, no matter where your business leads you.

Harris Adacom produces, markets, and supports communications systems worldwide. Our SuperNet™ STRATEGY products provide user interoperability between SNA, Token-Ring, Ethernet and other environments. We offer a complete line of products including gateways, controllers, display terminals, personal workstations, printers, and UNIX-based systems.

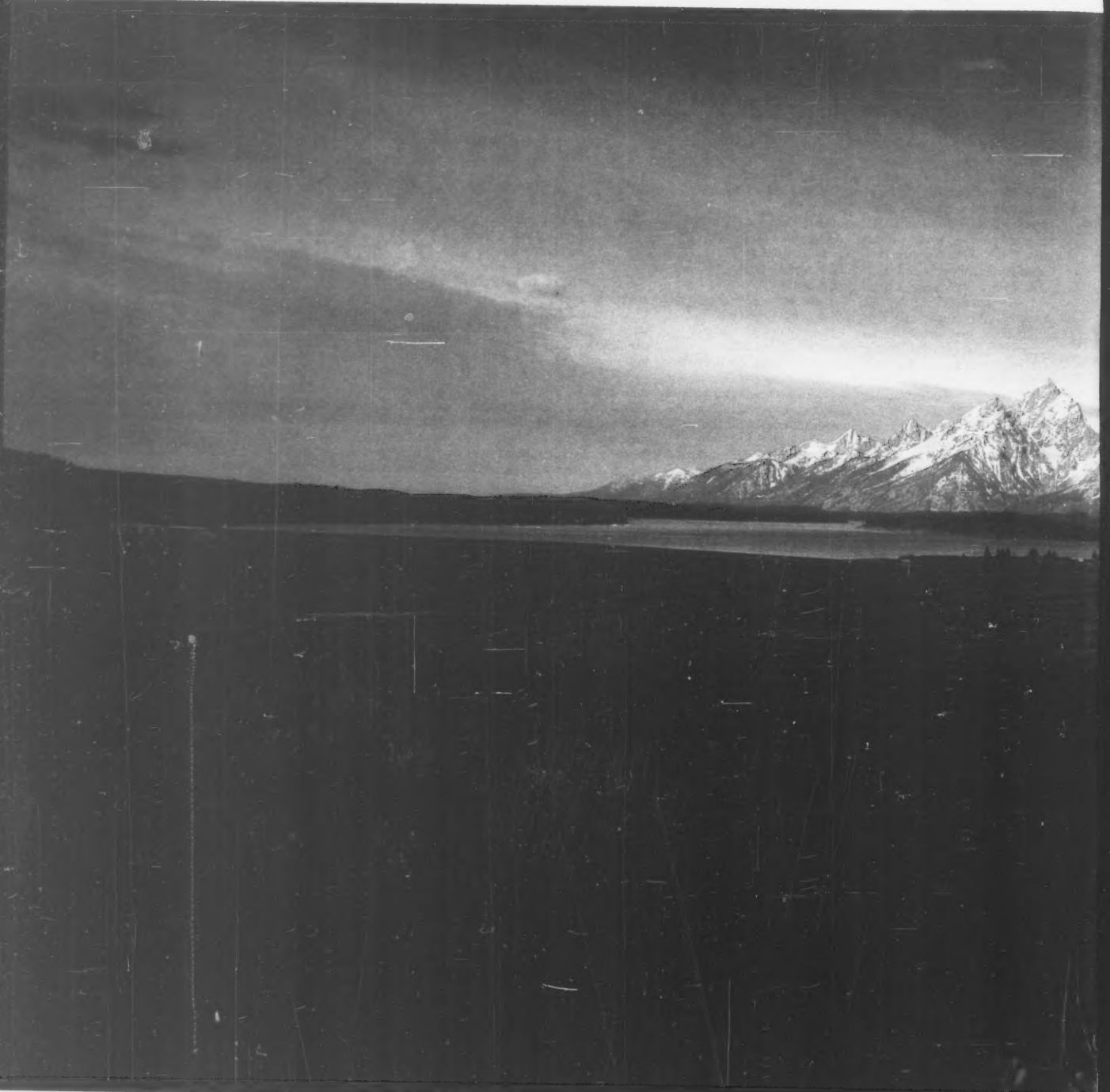
Harris Adacom. Your gateway to network integration.

**HARRIS  
ADACOM**

Tel: (214) 386-2000  
16001 Dallas Parkway, P.O. Box 808022  
Dallas, Texas 75380-0022



Welcome To The Wide Open Spaces Of Progress.



PROGRESS





Welcome to a 4GL/RDBMS world that lets you decide how to build and run an unlimited range of applications without the usual limits. Without the usual constraints.

Take a seat and let us explain.

To begin with, the PROGRESS 4GL lets you build with incredible efficiency while giving you the control of a full-structured programming language.

When the name of the game is development speed, you've got it. When the name of the game is control, you've got it. When the project calls for both, you've got both.

And just to make sure you like the view, you've also got a menu-driven application builder, ANSI-standard SQL and 3GL access if you want it. You've got a true distributed RDBMS with client/server architecture and two-phase commit. You've got multi-threaded, scalable performance on large multi-processor systems.

But stay seated, there's more.

PROGRESS ties together data across different operating systems, networks and databases. It lets you port applications without modification across UNIX, VAX/VMS, OS/2, DOS (even 640k PCs) and CTOS/BTOS with AS/400 coming soon. PROGRESS applications run unchanged over distributed networks using TCP/IP, DECnet, NetBIOS and SPX/IPX. They even update Oracle, Rdb, RMS and PROGRESS databases simultaneously.

What it all adds up to is 40,000 installations in 30 countries covering every conceivable application. Plus the #1 rating for efficiency, reliability, and overall user satisfaction in Datapro's last three surveys.

So find a phone and call **800 FAST 4GL** to find out about the PROGRESS Test Drive and the full Datapro report on PROGRESS.

Once you step into our world, you'll never want to leave.

*Progress Software Corporation*  
5 Oak Park, Bedford, MA 01730  
Telephone 617 275-4500  
Fax 617 275-4595

PROGRESS is a registered trademark of Progress Software Corporation. Datapro, UNIX, VAX/VMS, OS/2, DOS, CTOS/BTOS, AS/400, TCP/IP, DECnet, NetBIOS, SPX/IPX, Oracle, Rdb, and RMS are registered trademarks of their respective manufacturers.

SEE US AT UNIX EXPO BOOTH #1063



**T h e   U s u a l   L i m i t s   D o n ' t   A p p l y .™**

## COMMENTARY

J.A. Savage

## How (not) to market



Riddle: Which computer vendor has had easy-to-use software for as long as the concept has been

around? Whose lawyers failed to follow up on other corporations' "liberating" software ideas until it was too late — way too late? What company name is synonymous with "Kleenex" to trademark lawyers? Which company is about as close to making it in the 1990s as it is to the front of the alphabet?

If you haven't guessed Xerox by now, you should read this column.

**X**EROX SEEMS to think that it can change the minds of consumers more easily than it can change the style of the company.

Last month, Xerox introduced two new products. First, it ported its easy-to-use document and networking software — a hit with the few people who had bought its proprietary systems in the last few years — to a Unix platform on Sun Microsystems hardware.

Next, it introduced a machine of great proportions — one that copies, scans images and prints. It also slices, dices and shines your wingtips while humming.

With its historical lack of marketing in mind, the new tack appears to be selling Xerox as a "document company." Whoa, new stuff here. Why not a "computer company" or a "document and computer company?"

Xerox seems to think that it can change the minds of consumers more easily than it can change the style of the company.

Xerox officials say that the new way of thinking about the word "document" includes computers in its definition; that is, "document" can mean something other than just a piece of text.

"The document of the future will not be passive. It will not be just paper. It will be digital, even when it's on paper. And because it will be digital, it will be compound, complex, collaborative and computational.

It will not be linear. It will be instead a multidimensional web of information." So speaketh John Seely Brown, vice-president of advanced research at Xerox.

Please read more of Xerox-speak, and I won't have to remind you that it was developed and delivered in northern California, where even as companies attempt to sell to consum-

ers, they mock those same consumers as macrobiotic airheads (Honda and Ford, for two instances).

Only Seely Brown did not appear to be making fun of anything in this speech, delivered at a recent press conference.

"The document will be a space," he said. "We actually use the term 'docuspace' here at [Palo Alto Research Center] —

an evolving spiral of information like a spiral galaxy trailing connections to other spiral galaxies of information."

If this is Xerox's new marketing technique, it appears that the only people who will understand it are sitting in the lotus position — I don't mean 1-2-3 — on top of a mountain.

P.S. If you still don't get the Kleenex connection, Xerox law-

yers jump all over us writer-types when we use the word xerox to mean "copy." Xerox is a trademark, like Kleenex, say the lawyers. If only they were as quick to spot all those other vendors that admittedly lifted the look-and-feel of Xerox's software ideas . . .

Savage is a *Computerworld* West Coast senior correspondent.



## How did anyone WordPerfect

For years now, people have been searching for a better way to communicate. Where information is shared and a

to one department or division. You can link your networks together for an enterprise-wide solution.

**E-Mail. A package that delivers.** In practically no time at all, you can circulate a message to the people you choose, or to the entire corporation. And you can deal with information when you're ready.

E-Mail brings you and your company face to face with the power to send messages, WordPerfect documents or up to 100 attached

files of any format. You can send a

E-Mail carbon or blind copy, or keep your messages confidential by using password protection and encryption.

And if you're worried about something you may have said, don't worry. E-Mail even gives you control over messages that have been sent. It lets you see when a message has been delivered, opened or deleted. Then it lets you retract it, change it and send it back again.

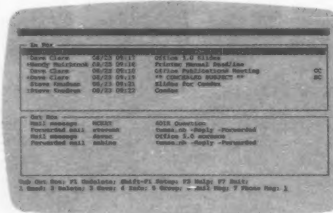
diversity of ideas can flow. It's a simple concept, really. Keeping it simple, however, takes a powerful solution.

Introducing a family of productivity products that finally connect with the way companies work. Introducing WordPerfect Office™ 3.0.

**It's all on the menu.** WordPerfect Office starts with a shell menu that's easy to relate to and even faster to use. Instead of having to exit to a DOS prompt, the WordPerfect Office 3.0 shell lets your people jump between the programs they use most, like spreadsheets, and word processing.

The stand-alone version, WordPerfect Office PC, provides you with a Calendar, Notebook, Calculator, Program/Text Editor and File Manager to keep organized. The network version, WordPerfect Office LAN, also comes with E-Mail and Scheduler to keep in touch.

And with WordPerfect Office Connections™, you're not limited



## EXECUTIVE CORNER

## Prime reaches out to AT&amp;T for VP

Prime Computer, Inc. announced earlier this month the appointment of **David R. Fernald** as vice-president of marketing at its Computer Systems Business Unit, an autonomous unit that contributed \$420 million in revenue to Prime's bot-

tom line last year. Prior to Prime, Fernald served as distribution vice-president at AT&T.

Ending a four-month search, **Octel Communications Corp.** in Milpitas, Calif., appointed **Gary A. Wetsel** as its vice-president

of finance and chief financial officer. Wetsel came to Octel from American President Companies in Oakland, Calif., where he served as vice-president of financial plans and controls. He replaces Robert G. Sweifach, who worked as Octel's financial ex-

pert from the firm's start-up.

Effective today, electronics industry veteran and former Thomson Consumer Electronics C.V. executive **James J. Hogan** is senior vice-president at **Wang Laboratories, Inc.** Hogan, who began his career at General Electric Co. — the firm that gave Wang its chief executive officer, Richard Miller —

will also serve as president of Wang's worldwide personal computer systems business.

Switching from production to testing, former **3Com Corp.** marketing manager **Robert Buchanan**, 43, has moved to Lan-Quest Group in San Jose, Calif. Buchanan, one of 3Com's first employees when it started up seven years ago, will become vice-president and general manager at the network testing and engineering company's Labs Division.



## ever communicate before Office 3.0™

**A change in schedules.** Sometimes it takes more than E-Mail for people to finally get the message. With Scheduler, people, meeting rooms and resources can quickly come together. All you have to do is list and select the names and resources you need. Scheduler shows you when your room and equipment are free and lets you compare blocks of time when your people can meet.

**Gateways to other worlds.** If you're beginning to see how WordPerfect Office can bring your company together, imagine how it can connect you to other worlds. Gateways between remote sites, public mail services like MCI, Western Union EasyLink, and standard messaging systems like X.400, MHS and PROFS are soon coming into place. And it won't be long before WordPerfect Office is sending electronic mail and documents between

PC's and Macintosh, OS/2 PM, Windows, UNIX, VAX, Data General AOS/VS, and IBM System 370.

WordPerfect Office 3.0, complete with WordPerfect Corporation's world-famous support. It's a wonder anyone ever got along without it.

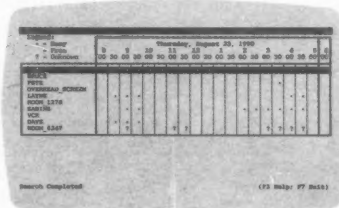
For more information about WordPerfect Office 3.0,

E-Mail, and a better network solution, start with this simple connection. 800-526-5166.

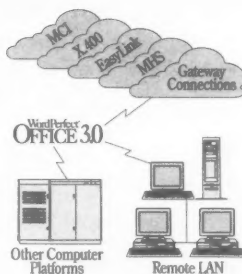
**WordPerfect CORPORATION**

1555 North Technology Way, Orem, Utah 84057  
Telephone: (801) 225-5000 FAX: (801) 222-5077

WordPerfect is a registered trademark of WordPerfect Corporation. WordPerfect Office and WordPerfect Office Connections are trademarks of WordPerfect Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. ©1990 WordPerfect Corporation



Scheduler



## Home PC

FROM PAGE 129

Blocher added. Business has been steady in recent years, but it appears to be slowing, he said.

An estimated 18 million U.S. households have income-generating home offices, and some 16 million households bring home at least one hour's worth of work per week, said Ray Boggs, who directs the small business/home office market service at research firm BIS CAP International, Inc. "With the overlap, that makes 31 million households that have a compelling need for PCs," Boggs said. "Right now, only 20% to 30% of those households have PCs."

Pleased with the early acceptance of the Personal System/1, IBM last month broadened the distribution into Europe and Canada and introduced a companion \$499 printer.

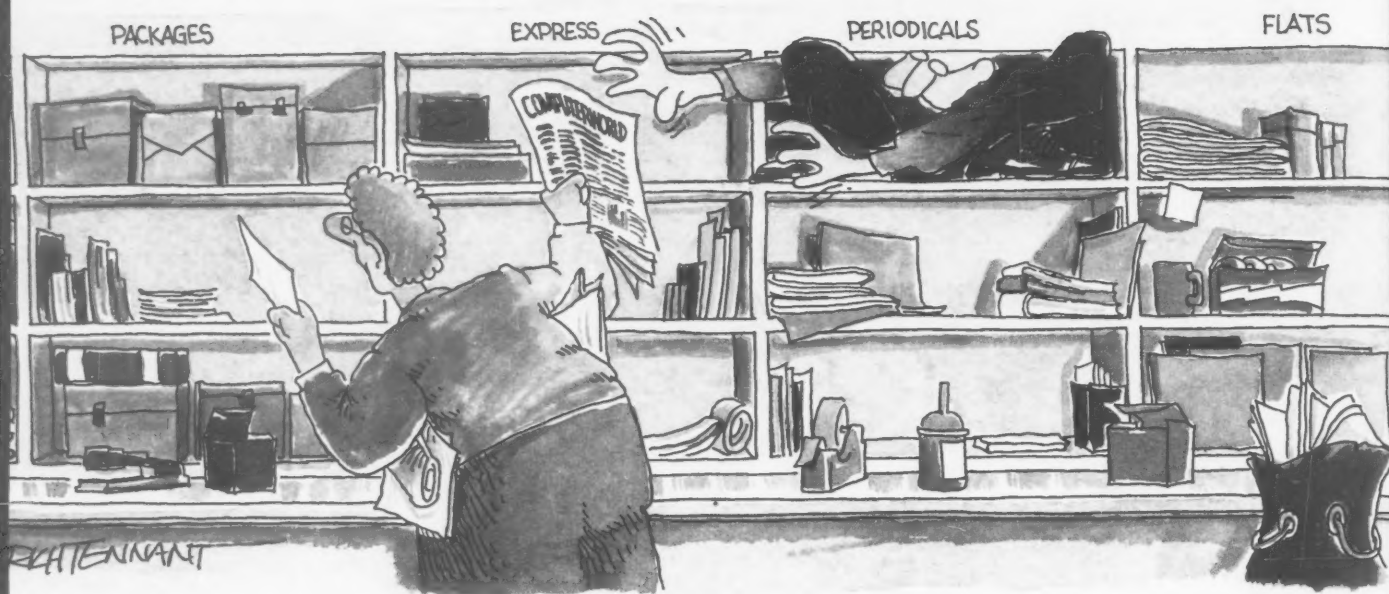
IBM said it sold "thousands" of the machines to home computer buyers in the first two months after the PS/1's June launch.

"New users — people who have never seen a computer outside of a video arcade" — make up the largest potential market for IBM's PS/1, according to James Cannavino, who heads IBM's personal systems business. Cannavino told a gathering of analysts this summer that he envisions "a computer in every kitchen."

Apple also expects to see its Macintosh in at least some of the estimated 93 million U.S. households. Earlier this month, Apple introduced a no-frills Macintosh dubbed the Classic with a suggested retail price of \$999. The machine comes with 1M byte of random-access memory and a floppy disk drive. A Classic with 2M bytes of RAM and a 40M-byte hard disk drive is priced at about \$1,500.

PC sales are showing signs of slowing, dropping from a 14% growth rate in 1988 to less than 10% this year, according to International Data Corp., a market research firm in Framingham, Mass. The home market, if one really exists, could help reverse the downward sales spiral, at least for a few years, analysts said.





## There's no end to how far people will go to get **COMPUTERWORLD** first.

Staying on the cutting edge of the information industry sometimes calls for drastic measures — especially if your name is way down on your company's *Computerworld* routing list.

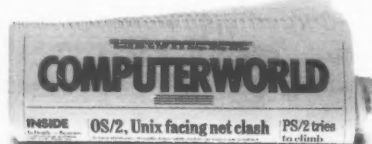
But there's really no need to put yourself in a compromising position.

Now you can be among the first in your company to get the most up-to-the-minute news on topics ranging from people and products to trends and technology to issues and information.

Simply order your own copy of *Computerworld* today and you'll receive 51 issues of the best-read publication in the computer industry. Plus, you'll get our special bonus publication, *The Premier 100*, an annual profile of the top companies using information systems technology.

Use the postage-paid subscription card bound into this issue to order your own copy.

And you'll no longer have to go to extremes to get to *Computerworld* first.



The Newsweekly of Information  
Systems Management



# COMPUTER CAREERS

## Job hunting? Consider searching on-line

BY KRIS HERBST  
SPECIAL TO CW

The number of on-line, computerized employment services is growing, despite the fact that many job seekers and employment professionals continue to use traditional methods to find a job or fill a vacancy. Representatives of computerized employment services say they are optimistic about the future, after having observed and learned from the mistakes of their predecessors — such as charging users for the service, for instance.

Electronic employment services use computers to store, retrieve and search job listings and resumes of job seekers from all walks of life. The diversity of these services is impressive; they offer an intriguing array of employment databases ranging from computer specializations to placement of the disabled to placement of ex-military personnel, according to Gayle Taylor, an editor of Cuadra Associates, Inc.'s "Directory of On-line Databases" in Los Angeles.

One driving force is the changing nature of the economy, which encourages the use of nationwide computerized databases: Rolling recessions that hit different industries and regions of the country at different times, along with shifts in the types of job skills now in demand because of technological advances and global trade pressures, have caused a certain amount of job churning.

Also, the relatively low cost of using an on-line service is appealing to John Reche, president of Polycon Corp. in Tempe, Ariz., he says. "For one thing, you're not paying for somebody who doesn't do

much other than give you someone else's name. "Charging 30% [of the initial year's salary] for a guy's yearly fee for that is a little exorbitant."

Some systems, such as one used by Career Technologies Corp. in Londonderry, N.H., allow employees to screen prospective employers before applying for a job by providing company profiles that give detailed information in categories such as working conditions and the financial health of the company.

Other advantages offered by electronic services include the following: employers don't have to maintain a large inventory of resumes; information can remain on a system for months at a time, whereas newspaper advertisements have a very short duration; and electronic screening using a standard format discourages job discrimination.

The Career Placement Registry, Inc., a subsidiary of IFI Plenum Data Corp. in Alexandria, Va., provides a general-purpose resume service on Dialog Information Services, Inc.'s on-line database. In an average month, it is accessed by 500 corporations that are looking for job candidates, according to Harry Allcock, vice-president of the Registry.

In 1981, IFI Plenum was one of the first firms to enter the on-line employment business. At that time, it already had a large database of patent applications available on Dialog. However, acceptance of the Registry's system was much slower than expected, Allcock says: "In the early '80s, there were seven or eight firms that spent several millions trying to compete

with us, and all of them in turn failed."

John Hawkins, president of Human Resources Information Network (HRIN), concurs: "Everybody who has gotten into the business of resume databases during the past five or six years has failed or met with marginal success, to say the best." However, he adds, HRIN watched for what it believed were the mistakes and tried to learn from them.

Possibly the biggest stump in the electronic employment path is tradition. On-line employment firms will have to displace universally accepted and well-entrenched traditional methods. The newspaper advertising bureau estimates that employers pay \$3 billion per year to obtain resumes by placing employment classified ads, notes Becky Van Winkle, a marketing representative for HRIN.

"Since the Civil War days, there have been only two traditional sources of employment information: the employment agency and newspaper classified ads," notes Steve Johnson, a career consultant for Behavioral Images, Inc. in Bloomington, Ind., an outplacement firm that uses both electronic and traditional employment services.

Employment and career professionals' fears that computers will oust them from their jobs is another major obstacle. When representatives from the Registry first tried to meet with employment professionals, Allcock says, "The comment was we are replacing people with a computer. So we decided we have to do it on our own."

The Registry's strategy was to offer

its service on Dialog, which allowed it to tap the large pool of clients, many from large, well-funded corporations that could already access IFI Plenum's patent service on Dialog. These potential customers already had Dialog passwords and didn't require training to understand on-line database searching.

In 1987, Jobnet, Inc. in Readstown, Wis., began offering a job listing and resume service called Employers' Jobnet via Compuserve, Inc.'s on-line service. "For a number of years, we tried to market this to the employment services placement people, and there was a great reluctance on their part to go computer," says Carl Poole, president of Jobnet. Faced with this rejection, Jobnet hired The Boeing Co. to create a sophisticated, user-friendly database system accessible to any job seeker or company recruitment officer who has a computer equipped with a modem.

Another problem is getting a sufficient volume of job or prospective employee listings, according to Allcock. Some firms tried to charge job seekers for listing their resumes on a system, but this discouraged large numbers of users from signing up.

Despite the painful lessons learned, most of the companies that have kept their heads above water, as well as users of these systems, are optimistic. "I think you are going to find that on-line information services are going to be the wave of the future," says Tom Price, vice-president of job development for Drake Beam Morin, Inc., a New York-based outplacement firm.

"We have invested a lot of money and time on the premise that employer recruitment is going to go electronic in the '90s," Poole says. "The question is, how rapidly is it going to go?"

Herbst is a free-lance writer based in Washington, D.C.



### DIRECTOR OF ACADEMIC COMPUTING SERVICES

WITTENBERG UNIVERSITY invites applications for the position of DIRECTOR OF ACADEMIC COMPUTING SERVICES beginning no later than September, 1991. The Director serves as the principal advocate for academic computing applications appropriate to the University's liberal arts mission, and acts as primary resource person in computing applications for faculty and students. Ph.D. preferred but strong candidates with Master's degree considered. Substantial experience in academic computing, classroom experience desirable. Experience with MS-DOS and VAX-VMS required. Some experience with Unix, Macintosh and Apple computers helpful. Experience with SPSSX also helpful. Evidence of good administrative, communication and interpersonal skills. Please send cover letter with application by December 14, 1990, to Edward Dungan, Director of Human Resources, Wittenberg University, P.O. Box 720, Springfield, OH 45501. AA/EOE

**wittenberg**

### CONSULTING OPPORTUNITIES TO \$60,000 DB2 and CASE TOOL TRAINING AVAILABLE

Now is the time to enhance your career in a highly professional environment with long term leading edge technology assignments.

We seek Professionals with at least two years experience with any of the following skills:

- IMS DB/DC
- DB2/SQL
- C/UNIX
- IDMS/ASCO
- ORACLE
- DICS
- MANTIS/SUPRA
- ADABAS/NATURAL
- COBOL PL/1

For consideration, send resume or call:

**TECHNOLOGY CONSULTING, INC.**  
2020 Meidinger Tower, Louisville, KY 40202  
(502) 589-3110 FAX (502) 589-3107



### SAN FRANCISCO BAY AREA

Please make note... Our clients have new and exciting openings with the following skills:

- ORACLE Applications Programmers, Designers, Data Base Development
- AS-400 Programmers, Analysts
- C/UNIX Programmers, Systems Administrators
- CICS/Banking Systems Analysts, Programmers

### THE SEARCH FIRM, INC.

595 MARKET STREET, SUITE 1400, SAN FRANCISCO, CA 94105  
(415) 777-3980 FAX 777-8632

### HOGAN SYSTEMS

Valley National Corporation, a leading financial institution with \$10 Billion in assets, has immediate opportunities available for qualified technicians experienced with **Hogan banking systems**. Senior Programmer through Senior Analyst positions available. Positions require hands-on experience in developing and enhancing Hogan based applications and strong COBOL programming skills in an IBM mainframe environment.

If interested, send resume to:

**VALLEY NATIONAL CORPORATION**  
P.O. Box 71-8321W  
Phoenix, AZ 85001



Valley National Bank of Arizona

RSVP SERVICES

ANALYSTS • PROGRAMMERS • HW/SW

### In a Slow Market, You Need A Quick Employment Service

If you have marketable skills, together with reasonable geographic and salary requirements, your resume will be on its way selectively, to our applicable contacts among our 1000+ client companies and 200+ affiliates nationwide, **within 24 hours after we receive it.** No cost or obligation to you, no sales pressure.

Our clients seek 2 years minimum professional experience, stable work history, good technical references, and U.S. citizenship or green card.

TO APPLY: Mail or FAX resume or call Howard Levin.

**RSVP SERVICES**

Dept. C, Suite 614, One Cherry Hill Mall, Cherry Hill, NJ 08002

800-222-0153 or FAX: 609-667-2006 (refer to Dept. C)

## TPF Denver

If you have 2+ years experience in TPF (Applications, Systems or Communications), we invite you to come to Covia's Data Center in Denver and get a new focus on TPF. Right now, we have immediate openings in application development, systems and telecommunications that will allow you to take leading edge technology to new levels.

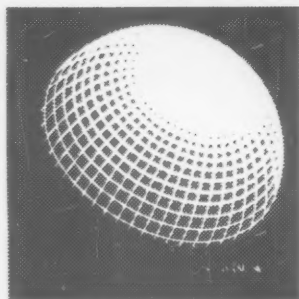
To arrange a local interview, call:  
**1-800-55-COVIA.**

We offer excellent compensation/benefits, worldwide air travel privileges and relocation assistance. If unable to call, send resume to: COVIA, Dept. CW10-091, P.O. Box 3194, Englewood, CO 80155. Equal Opportunity Employer. Principals Only.

*Imagine That!*

**COVIA**

## COMPUTER CAREERS



### amADEUS

GLOBAL TRAVEL DISTRIBUTION

AMADEUS - founded by Air France, Iberia, Lufthansa and SAS, is a computerized global reservation system for all travel related services. If you have always sought a challenging and progressive career abroad, AMADEUS offers you the opportunity of working in a fast developing international European company together with more than 300 EDP specialists of 20 different nationalities, where English is the business language. AMADEUS uses the latest and most advanced technology in the data processing and communications field to ensure that we have a leading role in this expanding market. Located in Munich, AMADEUS offers you all the aspects of a cosmopolitan European centre, famous for its long cultural tradition and unlimited leisure possibilities. We offer excellent conditions and generous assistance in relocation.

## Opportunities in AMADEUS Germany/Munich based

AMADEUS is currently recruiting the following fulltime specialists:

### TPF Systems Programmers

with at least 3 years of TPF systems experience to fill positions in the areas of

- File support
- TPF Performance
- Control Program
- ACPOB/TPFDF

### Communications Section Head

with at least 8 years of TPF/Communications/Airline experience. Responsible for communications/applications interface, including message switching, terminal format conversion and direct access

### Communications Specialist

with at least 3 years EDP experience (TPF or other communications). Knowledge of program to program communications protocols would be an advantage

### Communications Specialist

with 5 to 6 years TPF/SNA experience within a production environment and a good knowledge of airlines protocols

### Unisys Systems Programmers/Analysts

with at least 4 years experience to fill positions in the areas of:

- Test and Integration
- Fortran and Assembler programming
- USAS - ZYS, USAS - AEI
- Database
- TIP/HVTIP
- Performance and capacity planning
- OS 1100 EXEC

Please forward your complete application, which will be treated highly confidentially, indicating your salary expectations, to Nadya Fischer, AMADEUS Data Processing GmbH & Co., Berghamer Str. 6, D-8058 Erding/Germany, (Tel. 01149/8122/434960 or Fax 01149/8122/435390).

## SAUDI ARABIA/U.S. OPPORTUNITIES

Tax-Free Salaries. Free housing, medical, dental, transportation.

### SYSTEM ANALYSTS

COBOL, IMS, DB/DC, CICS, JCL

### EDP SYS ANALYST

ORACLE, HYPERCAD, Macintosh

XIS Modules, Display Technique

### SYSTEM ANALYST

10 yrs exp. BS Degree

DOBIS, LIBS, OS/AS, EUCX, BIMP,

PLI, CICS, JCL, TSO, SP/SP, MARK IV,

CLEST/REXX

### SYSTEM ANALYST

IBM, CICS, MVS, COBOL, PLI, SAS

SPF, IMS, Microsoft Word, Windows,

and Excel.

### TECHNICAL WRITER

7 yrs with Application Development,

3 yrs on IBM Mainframe CASE Tools.

### SYSTEM PROG/ANALYST

10 yrs exp. BS Degree

MVS, SP, SMS, AC, FJES, SMP, DFP,

HSM, GDDM, TSO, SP/SP, OV, VTAM,

3745 NCP, TCP/IP, UNIX, OS

### HARDWARE MAINT ENG

7 yrs exp performing fault diagnosis,

Interpret digital system performance.

### DIGITAL SYSTEMS TECH

4 yrs exp performing fault diagnosis,

Preventive maint, Network planning,

testing IBM 3745 controller line

interfaces.

### TRAINING ANALYST

3 yrs exp with tech degree. Write

procedures, instructions, staff tracking.

### SYSTEM PROG/ANALYST

10 yrs exp with BS Degree

IBM DF/HSM, DFSMS, DASD Cache

Mgmt, 3390/3990 DASD controllers.

### PC INSTALLER

5 yrs exp IBM PC/XT, AT, PS/2

Macintosh, Laser Printer, IBM DOS,

WINDOWS, LAN's, WordPerfect.

### EDP SYSTEM ANALYST

2 yrs exp with Tech Degree.

Security sys support, programming,

big mainframes, facility support.

Send Resume and Salary History to:

### THE LESLIE CORPORATION

400 East Sam Houston Parkway North, Suite 701C, Houston TX 77060

FAX (713) 591-0921

ATR, a growing computer consulting firm based in Northern Virginia, is seeking experienced professionals to keep up with our current business need. We have both long and short term positions, hourly and staff positions available for programmers, analysts, and DBA's. Individuals must have a minimum of 2 years experience in any of the following disciplines:

OS/2  
VAX-VMS, C  
IMS DB/DC  
ORACLE, SQL  
AS/400, COBOL  
CICS, COBOL

PRESENTATION MANAGER  
VMS SYSTEMS  
FOCUS  
INFORMIX 4GL  
SYS 38, 36  
DB-2, CSP

We provide BC/BS major medical and dental, 401K/profit sharing plan, direct deposit, and highly competitive rates. For more information, call or fax resume to:

### AMERICAN TECHNICAL RESOURCES

7353 McWhorter Place, #202

Annandale, VA 22003

(703) 658-0066

FAX: (703) 354-8512 (800) 537-1845

### BONUS!!!!

All consultants that come on board between November 1st and May 1st will be eligible to win a PC and monitor!!!

## Hardcore Software People

We need analysts/programmers for IBM or DEC environments. According to Inc. Magazine WTW is #130 of America's fastest growing companies. Join our team and earn what you're worth. WTW is a national software consulting firm offering excellent salary and benefits and the opportunity to position yourself for success.

Call immediately or send resume: 1-800-633-2884

Attn: Skip Marsh  
Weedon, Taylor, Wells  
P.O. Box 12274  
Research Triangle

Park, NC 27709-2274

Weedon, Taylor, Wells is an equal opportunity employer

### ASSISTANT DIRECTOR, PLANNING AND POLICY

The State of Washington, Department of Information Services is recruiting for an Assistant Director, Planning and Policy Div. Located in Olympia, the agency is responsible for ensuring that the state receives the best possible return on investments it makes in information technology. It both formulates and administers state policy and standards for information technology, and offers a broad variety of services to state and local government.

Major responsibilities include: formulation of state policy, goals, and direction for information technology; consultation with other agencies and legislature regarding information technology plans, projects, and overall performance; oversees state acquisition of information technology; and formulating statewide training policies for information technology.

Requirements: BA in computer science, business admin., public admin., or an allied field AND 7 yrs of progressively responsible experience working with information technology, including 5 yrs at the senior managerial level, 2 yrs experience in developing and implementing policies, and 2 yrs experience acting as staff to a policy setting board or executive committee.

Experience as a senior information technology consultant for an independent consulting group or firm may be substituted for 1 yr, for up to 3 yrs of senior level management experience.

Salary: \$3650-\$5057/mo. commensurate with experience/ability. If you are interested, submit resume no later than November 9, 1990 to: Sandy Farry, Human Resources Administrator, State of Washington, Department of Information Services, 1110 S. Jefferson MS: PC-22, P.O. Box 3019, Olympia, WA 98504, (206) 585-5432. We are an equal opportunity employer. M/F/H/V.

### STATE OF WASHINGTON

### Immediate Permanent/Consulting

### TANDEM

East Coast/Mid-West/West Coast

Junior & Senior P/A's  
System & Project Managers  
Marketing, Brokerage, Telephony  
Manufacturing, Comm & others

PATWAY, SCOBOL, COBOL,  
C, TAL, Non-Stop SQL, SNA, X,  
BASE-24, OLTP, QA

Mail or Fax resume to "love at"

### TALON

Professionals, Inc.

11827 Brenton Ct., Ste. C12

Reston, VA 22091-3224

(703) 264-5052

Serving Only TANDEM Users & Professionals Across the U.S.

### CA & AZ CONTRACTS

### CONSULTANTS WANTED



P. Murphy & Associates, Inc.

4405 RIVERSIDE DRIVE, SUITE 100

SUNSHINE, CA 91506

(818) 841-2002 (714) 552-0506

FAX: (818) 841-2122

COMPUTER ENGINEER: Ph.D.

with major in Electrical Engineering.

Apply principles of electrical engineering, computer imaging, and cerebral blood flow analysis to perform research, development, and design of a system configuration for Xenon-Enhanced Computerized Tomography System, design the algorithms for cerebral blood flow calculation and analysis. Develop the software package. Must be knowledgeable in Image Reconstruction, Cerebral Blood Flow Analysis, Digital System and Software Engineering (3 hrs. of coursework, dissertation or 1 yr. hands-on experience in each area) \$45,000/yr., 40-hr wk. Apply at the Texas Employment Commission, Houston, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O. #6122901. Ad Paid by An Equal Employment Opportunity Employer.

## ANOTHER REASON WHY COMPUTERWORLD RECRUITMENT ADVERTISING WORKS ...

Computerworld gives you the unique option of REGIONAL or NATIONAL recruitment advertising.

Whether you want to run your ad in the Eastern, Midwestern, Western, National, or any combination of regional editions. Computerworld gives you the only regional recruitment advertising section available in the United States exclusively for computer professionals. And no other newspaper or magazine reaches so many qualified computer professionals regionally or nationally!

### Computerworld's Total Audience by Region



SOURCE: Audit Bureau of Circulations Supplemental Data Report, May 1987.

To place your ad regionally or nationally, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).



### COMPUTERWORLD

Where the best hires look. Every week.



### Put your career on the map in Phoenix, Arizona!

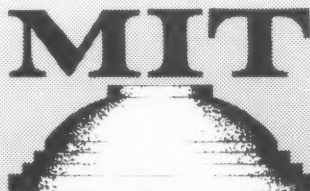
Enjoy the best of both professional and personal worlds with CIBER in exciting Phoenix, Arizona. We are a progressive, growth-oriented consulting firm with excellent career opportunities for motivated individuals with a minimum of three years data processing experience in an IBM Mainframe environment. Immediate openings exist in the following areas:

**COBOL** **PL/I**  
**IMS DB/DC** **IEF CASE**  
**DB2** **TRANFORM**  
**DLI, CICS** **TELECOM**  
**CICS** **MODAN**

We'll reward your expertise with a competitive salary and benefits package including relocation assistance. Arizona is a land rich in history with year-round sunshine and a variety of cultural and recreational activities. Put your career on the map by forwarding your resume with salary history to:



CIBER, Inc.  
Dept. CW60  
3003 N. Central Ave.  
Suite 2512  
Phoenix, AZ 85012  
Call (602) 234-0411  
Fax (602) 265-7185  
An Equal Opportunity Employer M/F



### Systems Programmer Laboratory for Computer Science

To maintain and improve a large software system written in Common Lisp. The focus will be to modify and improve the existing system.

**Requirements:** an MS in Computer Science or a BS with a minimum of 3 years' experience. Expertise in Common Lisp required. Familiarity with Common Lisp on a variety of platforms, with C and UNIX and with functional languages desirable.

Interested candidates should submit two copies of a resume and cover letter referencing Job No. R90-90 to: James H. McCarthy, MIT Personnel Office, Bldg. E19-239, 400 Main Street, Cambridge, MA 02139.

MIT is an Equal Opportunity/  
Affirmative Action Employer  
MIT is a non-smoking environment

**Massachusetts  
Institute of Technology**

**PROGRAMMER/ANALYST** to design and implement software packages for airline and travel application using COBOL/CICS. Provide end user support and handle database management. Must have B.S. in Computer Science plus one year experience in same or related job. 9-5, M-F. \$26,000.00 p.a. Submit Resume Only to: JOB SERVICE OF FLORIDA, 701 S.W. 27th Avenue, Room 15, Miami, FL 33135. Ref: Job Order #FL03523178.

### UNISYS

Programmers, Analysts, DBAs and PLTs with experience in:  
•1100 / 2200 Mainframes  
Any: DMS, DPS, TIP, COBOL, MAPPER, MASM or USAS  
•A/V/B Mainframes  
Any: DMSII, COBOL, ALGOL, LINC, COMS, MISER or MCP  
•Banking, Retail, Distribution, Mfg, Health Care, Insurance, MSA or Financial applications  
Perm. placement thruout US

**COMPUTER STAFFING**  
call 800/88UNISYS

## SALES PROFESSIONALS

# Layoffs?

## The World's Leading Software Company Is Hiring.

While other companies are "consolidating", "retrenching" and just plain laying off, Computer Associates is expanding and adding to its team of world class Account Managers.

In just fourteen years, Computer Associates has become the # 1 independent software company in the world. The first to achieve and pass the 1 billion dollar mark in worldwide sales. We offer and support more than 300 products which span every major hardware platform from micros to mainframes. In fact, we offer more software for IBM and Digital than anyone else.

We have a limited number of places on our district sales teams for aggressive, hard-driving, high achievers like you who can close business. And not just any business: almost 100% of the Fortune 500 depend on CA software.

This could be the most significant career move you ever make. Because at CA, our single most important goal is to be the best. That's the attitude that has brought us to the top and fueled continued growth and sales opportunities.

If you have the qualities we're looking for, we want to talk to you. Prior industry experience in applications, systems or database software is desirable. For immediate consideration, send your resume with salary history to: Personnel Department, Department CW-15, Computer Associates International, Inc., 711 Stewart Ave., Garden City, N.Y. 11530. An equal opportunity employer M/F/V/H.

Domestic Sales Offices are located in Major Cities in These States:

Arizona • California • Colorado • Connecticut  
Florida • Georgia • Illinois • Indiana • Maryland  
Massachusetts • Michigan • Minnesota • Missouri  
New York • New Jersey • North Carolina • Ohio  
Oregon • Pennsylvania • Texas • Utah • Virginia  
Washington • Wisconsin

**COMPUTER  
ASSOCIATES**  
Software superior by design.

© 1990 Computer Associates International, Inc., 711 Stewart Avenue, Garden City, N.Y. 11530

**Software Engineer II** - Responsible to design, develop & implement applications for an existing automated technical documentation system on a VAX/VMS system using DCL, C & Pascal programming languages; design, develop & support product front-end Text macro packages; work on importing other front-ends written in Text or LaTeX macro packages; design & implement software to support a generic markup language (SGML) batch & interactive processing, graphics, & multiple output destinations (including LINO & Postscript); work on porting system to UNIX environment; work on project teams, prepare functional specifications & progress reviews. Requirements are: A Bachelor's degree in Computer Science or Mathematics, C & Pascal, programming & theoretical knowledge of Text &/or layered macro package such as LaTeX, knowledge of VAX/VMS operating system, UNIX, DCL, graphics, knowledge of the design & implementation of software systems. Salary \$34,216.00 per year. No exp. req. 40 hr/week 8:15am-5pm. If you are interested in, & qualified for the above position, please forward your resume to: NH Department of Employment Security, Attention Job order #91-6, Employment Service Bureau, 32 South Main Street, Concord, NH 03301-4857.

**System Software Engineer**, Systems Group. By 11/28/90 please send resume to: Employment Security Department, ES Division, Attn: Job # 230005, Olympia, Washington 98504. Job Description: Designs, implements and tests complete and high level systems and software for micro computers. Works with other engineers to coordinate, execute and evaluate automatic test procedures for OS/2 operating system utilizing MS-DOS operating system. Responsible for evaluation of test results, including utilization of statistical analysis. Instructs and trains contract employees in testing procedures. Assumes major project responsibility including: 1) requirements and analysis of project specifications; 2) product design; and 3) implementation schedules. Requirements: B.A. or B.S. in Electrical Engineering, Computer Science, Mathematics or Physics. Six months work experience in computer design or programming utilizing MS-DOS operating system. Six months work experience instructing or training in engineering, computer science, mathematics or physics. 20 course hours in mathematics and statistics. Must have proof of legal authority to work in the United States. Job location: Redmond, Washington. Salary: \$33,500-\$36,000 per annum, depending on experience. 40 hours per week, flex time. EOE.

### SOFTWARE DEVELOPMENT

HEADQUARTERS  
314-567-1396

FAX  
314-567-6579

### APPLICATIONS PROGRAMMING

NETWORK DESIGN  
AS400 \* OS/2  
MS-DOS \* ORACLE  
DEC ALL-IN-ONE  
EASEL \* UNIX-C

### DATA BASE DESIGN

PROGRAMMING &  
SYSTEMS  
CONSULTANTS

Oklahoma \* Florida \* Georgia  
Missouri \* Ohio \* Illinois

For immediate response call  
or fax your resume to:

**Programming & Systems Consultants**  
11720 Borman Drive, Suite 102  
St. Louis, MO 63146



# 50 Ways To Leave Your Company

In today's world of mergers and buyouts, your future with a company can be uncertain. You owe it to yourself to take charge of your career. There can be up to 50 companies at TECH FAIR® where you can meet and discuss the high tech marketplace.

TECH FAIR offers an excellent opportunity for engineers and computer systems professionals to meet face-to-face with high technology companies who have job openings that need to be filled immediately.

At TECH FAIR, you can find out what you're worth, explore new career possibilities, get a closer look at projects and position openings, all in an informal, no pressure atmosphere.

So, come to TECH FAIR and find 50 ways to leave your company. There's a TECH FAIR coming to your area soon.

## OCTOBER TECH FAIRS

October 15 - 16  
Long Beach Airport Marriott, Long Beach, CA

October 22 - 23  
Grand Kempinski, Dallas, TX

October 29 - 30  
Airport Hilton, Mpls, MN

Free Admission  
Hours: 3PM-8PM

### TECH FAIR®

THE NETWORK FOR HIGH TECHNOLOGY SYSTEMS & SOFTWARE DEVELOPMENT PROFESSIONALS  
TECH FAIR is a Trade Show or Business People  
Sponsored by BPI, 2885 Mulberry Tower, 21 South Sixth Street, Minneapolis, MN 55402  
For information call (612) 370-0550. We are not an employment agency.

## BUSINESS SYSTEMS DEVELOPMENT MANAGER

Senior Level Position In The Development Of Marketing Applications

Our Information Systems Division seeks a seasoned professional to manage and direct all aspects of marketing systems applications and development within the Business Systems Development Department at our Corporate Headquarters.

You will develop market analysis systems to fulfill department objectives; identify and implement improved tools and techniques; and direct a staff in total development efforts, including assisting in strategic technology plans.

Experience must demonstrate multi-tasking and proficiency in project management of marketing analysis systems. Also essential are knowledge of structured methodology; exposure to a large IBM environment; MVS experience; and a background with large database applications, preferably DB2. Superior communication, budgeting and presentation abilities are imperative. Mainframe and PC skills are desired.

As a member of the Fortune 500 Philip Morris Companies Inc., Miller rewards initiative and leadership by providing an excellent salary, impressive benefits and significant potential for professional enhancement. Please send your resume, in strict confidence to: Corporate Recruitment, Dept. #1057-90, MILLER BREWING COMPANY, 3939 W. Highland Blvd., Milwaukee, WI 53201.



Employing and Promoting  
Equally Today and Tomorrow

**SYSTEMS ANALYST.** Utilizing knowledge of VAX/VMS & UNIX OS & VAX/DBMS, INGRES & ORACLE D/B/M/S, perform analysis of user's Req's., develop in-depth understanding of user's business for customization of manufacturing & business applications, soc. to d't's needs. Integrate req's w/technical aspects of various software systems, such as Information, Finl Mgt, Manufacturing & GC. Design, develop & implement customized applications, develop appropriate software design & specifications. Train user's staff in use of software tools on various hardware, using FORTRAN & C. Design & implement enhancements & modifications to existing systems, such as ASK MANMAN systems. REQ'S: B.S. in Electronic Eng or Comp Sci, 2 yrs. experience in above duties or 2 yrs. exp. as Systems Analyst (design & development of customized business applications, using C & FORTRAN). Will accept applicant w/ M.S. degree in Electronic Eng or Comp Sci & 1 yr experience in job duties or related. 40 hrs/wk; 9-5; \$36,500/yr. Resume to Illinois Dept. of Employment Security, 401 South State Street - 3 South, Chicago, IL 60605, Attn: L. Donegan, Ref #V-L-1739. No Calls. AN EMPLOYER PAID AD.

**RESEARCH ARCHITECT -** Develop mainframe computer packages for modeling three dimensional automobile structures subjected to crash loading; to assemble various parts of automobile structures graphically, prior and post crash environment and to facilitate the understanding of the architectural design and manufacturing feasibility of automotive body structures. Salary, \$30,000 per year, basic 40 hour week (8:30 a.m. - 5:00 p.m.). Requirements, high school graduate; 5 years of college with a Master's Degree in Architect or Structural Engineering; one graduate level course in Computer Graphics & Modeling; one graduate level course in Three Dimensional Computer Graphics & Modeling; one graduate level course in Computer Aided Architectural Design. Send resumes to: MESC, 7310 Woodward Ave., Room #15 (Reference No. 76390) Detroit, MI 48202. Employer paid ad.

**SYSTEMS ANALYST** - Analyze business procedures and problems to refine data and convert it to programmable form for electronic data processing. Specifies logical and mathematical operations to be performed by system, develop new information systems to meet current needs. Prepares technical reports and manuals for the functioning of the operating systems, prepares programs for computer use. Education must include: Intergraph programming techniques, courses in FORTRAN, C and COBOL programming languages; UNIX, DOS and VAX/VMS operating systems and Oracle database management system, SQL and embedded SQL is also required in BS with Computer Science major, 40 hours per week. Salary \$1097.65 bi-weekly. Reply with SSF to Ind. Dept. of Employment and Training, 10 N. Senate Ave., Room 210, Indpls., IN 46204. Attn: W.J. Shepherd, ID#3180546.

### COMPUTER PROGRESS UNITED

\$40,000 to \$60,000  
We provide Fortune 500 companies with consulting and programming services. We have immediate positions available for P/A in Kentucky, Ohio, Indiana, and Tennessee. We are the DB2 Specialist!

### TELON

DB2 • IMS • CICS

Send resume or call  
Computer Progress United  
1730 Tompawke Way  
Louisville, KY 40243  
(502) 245-6533

**DEVELOPMENT STAFF MEMBER:** Conduct Research in theory of parallel and distributed computation. Design and implement parallel algorithms and programs for scientific/engineering and commercial applications. Design fault-tolerant multiprocessor architecture. Must have Ph.D. in Electrical Engineering, 1 yr. on the job exp. or 1 yr. exp. as a Pre- or Post-Doctoral Research Assistant. 1 yr. exp. must include research in theory of parallel and distributed computations as well as fault-tolerant multiprocessor architectures design and parallel computation. 40 hr/wk; \$60,000/yr. Send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O.# 5424590. Ad paid by an equal employment opportunity employer.

### AS400 Programmer/Analyst TO 40,000

Dynamic AS400 environment seeks candidate with strong analytical and RPG III programming skills. Experience with financial or manufacturing systems will be considered a plus, but not required. If you desire to enhance your technical skills and career goals, call for further details. Heavy bonuses will be in new development.

### CICS Programmer/Analyst TO 40,000

Opportunities exist in the Midwest for top-notch CICS programmer/analysts that desire challenge and upward mobility. These companies offer state-of-the-art technical environments, heavy emphasis in new development and designated career paths. Companies provide great benefits and dynamic technical environments.

### Data Analyst TO 50,000

Midwest firm has immediate need for a Data Analyst with a minimum of 3 yrs logical data base design, strong knowledge of relational concepts and familiarity with CASE technology. This is a state-of-the-art IBM mainframe environment offering tremendous growth potential. If seek opportunity with one of this countries leading firms, call for further details.

### ROBERT WALF

Information Systems  
7733 Forsyth  
St. Louis, MO 63105  
1-800-825-HALF  
FAX: (314) 727-1321

### MANAGER NETWORK OPERATIONS

Huntington, WV based Coal Company is seeking an experienced Manager of Network Operations to plan, direct and manage the installation operations and maintenance of a complex corporate wide data communications network. This includes monitoring, controlling and resolving network problems and providing a help desk function where end users can report hardware, software and computer related problems for appropriate resolution.

Qualified candidate will have Bachelor's degree in telecommunications, business administration or electrical engineering. Experience in supervising or playing a lead role in network operations, telecommunications or computer operations. Experience in maintaining PC local area networks. Experience with Intron, Prime and/or Novell a plus.

We offer an excellent employee benefits package. If qualified, please forward your resume with salary requirements to:

ASHLAND COAL, INC.  
Employment Department  
P.O. Box 6300  
Huntington, WV 25771  
An Equal Opportunity Employer

### Exceptional Opportunity

Blue Chip Corporation has an immediate need for a Manager of System Development. Requirements include 10 years of progressive MIS responsibility, with 2 of those years in project management. Must have outstanding communication skills and professional demeanor. B.S., C.S. required; M.S. preferred. Need strong system development background from distribution or military industry. Salary \$50-\$6K + 10% bonus. Midwest location.

**EFFECTIVE SEARCH INC**  
Charles C. Miller CPC  
Epic Center  
301 N Main, Ste 1390  
Wichita, KS 67202-1508  
FAX 316-267-9187

# One thing every executive should have after retirement: An adventure.

Gold watches are fine for some retired executives. But after a lifetime of experience, moving from the trenches to the front offices, your knowledge is worth more—to us and to hundreds throughout the world in need of your special skills.

Through the International Executive Service Corps—the not-for-profit organization that sends U.S. managers to help businesses in developing nations—you can volunteer for short-term assignments in foreign countries where you're truly needed. Although you will not be paid, you and your spouse will receive all expenses, plus the personal satisfaction of teaching others while you discover more about yourself.

It's an adventure of the spirit. And the time to explore it is now. So please, don't let this golden opportunity pass by. Send for more information today.



**International Executive Service Corps**



Turn your lifetime of experience into the experience of a lifetime.

YES, I'd like to share my lifetime of experience with others. I recently retired from my position as a hands-on manager with a U.S. company. I also understand that volunteers and their spouses receive expenses, but no salary. Please send me more information now.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

In what publication did you see this ad?

Write to: IESC, 8 Stamford Forum, P.O. Box 10005  
Stamford, CT 06904-2005. Or, for faster response, call this number: (203) 967-6000. BP



**SENIOR SYSTEMS ANALYST**  
wanted. Duties: Lead analyst for the systems analysis, design, development, data conversion, user training and documentation for a payroll and personnel information system. The responsibilities include process flow and data flow design, data modeling identification, data base design, system testing, conversion and technical support. This system is being developed using UNIC II fourth generation language on a Univis A12 computer. Database, utilities and other software used in this project are: DMS II, COBOL, ERGO, COMS, MCP, WFL, CANDE. The Payroll and personnel information system includes employee database, Personnel Administration management, Position control, Payroll Insurance benefits, applicant tracking, substitute tracking and Risk Management. Study, design and develop an integrated Court Management System including a domestic relations on Univis A series computer using UNIC II Need Master's in Computer Science, Engineering or Physics and 1 yr. exp. as a programmer Analyst, Systems Analyst, or Systems Consultant. All the related exp. must include the following hardware, software and business applications: Univis A series, Univis B 1500, IBM PC, UNIC II, COBOL, DMS II, MCP, COMS, ERGO, WFL, Payroll and Personnel Administration systems and Court Management Systems. Pay is \$40,000/yr. 40 hr/wk. Resumes to 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. #78490. Employer Paid Ad.

**Programmer Analyst**, Milwaukee. Will develop of Text Management (Search & Retrieval) Software Products seeks individual to code and maintain on-line COBOL/CICS applications; perform technical problem determination and reason using INTERTEST to debug and verify the accuracy of results; assist in program design of applications for Bill of Material processing with Relational Databases (entity relationships, normalization of data and identification of relational integrity); develop pseudo code or Warnier-Orr diagrams from design specifications; use Structural Query Language for retrieval of DB2 data within COBOL applications; ensure program passes test plan. Requires BS or MS in Computer Science (BS must also have 2 years' experience in Computer Programming). Also requires (may be concurrent): 1 year work experience or 1 academic year of part-time research experience in VAX/VMS OS plus one college-level course in each of Relational Database Systems and Software Life Cycles. Salary \$28,000; 40-hr work wk. Mon-Fri. Contact O.J. Regins at Milwaukee North Job Service, 6067 N. Teutonia Ave., Milwaukee, WI 53209 with resume and transcripts for Job Order #0379131.

**Software Engineer (Research & Development)**, 40 hr/wk, \$30-35,000/yr. Software support for the design & development of 2-80 MP-based modems which are used for transmission, error detection & retransmission of electronic data for cellular telephone applications. Design & development of 2-80 MP-based intelligent interface products to allow direct-connections of cellular telephones to portable business machines. Design & development of stand-alone products to integrate air-line data transmission capabilities into existing telephone switching capabilities. Research & development of add-on & interface products for cellular telephones. Min Req: MS or completion of entire MS program in Computer Science, 6 college credit hrs in courses covering microprocessors & 3 hrs in courses covering either electronic circuit design OR system design using integrated circuits. Past design & development of a microprocessor-based system using Z-80 Assembly. Apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778. J.O.#5424592. Ad Paid by an Equal Opportunity Employer.

**SYSTEM ENGINEER:** Conducts research and analyzes data-processing requirements to develop computer systems. Using knowledge of "operating system," "architecture/system programs" and "artificial intelligence" to design software systems to implement computer outputs and functions. Studies existing systems, evaluates effectiveness and develops new systems to improve speed and efficiency. Requires M.S. in Computer Science with 3 credit hour coursework each in operating system, architecture/system programs, and artificial intelligence. 3 months experience in the job or as Software Engineer. \$25,000/yr. 40 hr/wk. Apply at Texas Employment Commission, Houston, Texas, or send resume to Texas Employment Commission, TEC Building, Austin, Texas 78778. Job order #512286. Ad Paid by an Equal Opportunity Employer.

## Information Services Systems Programmer

Children's Hospital, Inc., one of the nation's largest and most progressive pediatric healthcare centers, has an excellent career opportunity for a Systems Programmer in our Information Services Department.

Responsible for the installation and maintenance of numerous system software products in an MVS shop, you must possess a bachelor's degree with at least 1-2 years programming and systems experience. An understanding of CICS and MVS/XA or MVS/ESA is preferred.

We offer a highly competitive salary and excellent benefits in a friendly, smoke-free work environment. Interested candidates please call 614/461-2180 or send your resume to: Susan Craig, Recruiter, Personnel Department, Children's Hospital, 700 Children's Drive, Columbus, OH 43205.



## SR. PROGRAMMER ANALYST

**IBM 3090 Mainframe  
\$30-\$35K D.O.E.**

- New Development Positions
- Diverse and Challenging Work
- Relocation Assistance Available

Dept. of Health and Welfare has immediate openings for COBOL/CICS/VSAM professionals who have had accounting system experience. We also have positions available for experienced ADABAS/NATURAL2 professionals. Explore Idaho in a 4 season climate that averages 214 days of sun. Idaho's low cost of living offers a quality lifestyle as well as cultural amenities and recreational opportunities you don't want to miss. Idaho...America's Best Kept Secret.

For further information  
Contact Larry Tippett, 208-334-5653.

BOE



## A Terrific Opportunity

Computer Consulting Group, one of the Southwest's fastest growing contract programming and consulting firms, has immediate openings for talented Programmer/Analysts with 2 or more years experience. Excellent salary & benefits package. We're especially seeking:

- NATURAL/ADABAS
- CICS/COBOL
- IBM/COBOL
- IBM/VSAM
- IBM/VSAM
- IBM/VSAM
- IBM/VSAM
- IBM/VSAM
- IBM/VSAM
- IBM/VSAM

**Computer Consulting Group**

Contract Professional Services

Research Triangle Area  
4109 Wake Forest Rd.  
Suite 307  
Raleigh, NC 27609  
1-800-222-1273  
(803) 738-1994  
FAX (803) 738-9123

## San Antonio One of the Many Things You'll Find Right With USAA.

When you make the move to USAA in charming San Antonio, Texas, you'll find easy commuting, big-city amenities and one of the lowest living costs in the country. It's a comfortable lifestyle that's great for families, and it's only one of the many things you'll find right with USAA. You'll also discover our people-first attitude, our commitment to breakthrough technologies and our 68-year dedication to quality of service. Qualify for one of our data processing positions, and you'll find that USAA is the right move, right now.

United Services Automobile Association, an integrated family of companies providing insurance and financial products and services to officers of America's armed forces, offers superb work and recreation environments, a four-day week, innovative benefits and vigorous career development.

### Come to USAA's OPEN HOUSE

At The Marriott at the Capitol  
701 East 11th St.  
Austin, Texas

Monday, November 12th and  
Tuesday, November 13th  
from 10:30-2:00pm and 4:30-7:30pm

We will be interviewing for DATA PROCESSING PROFESSIONALS.

Look for details in the next edition of Computerworld.

No Agencies, Please. An Equal Opportunity Employer, M/F.



## Senior Systems Analyst

Make a Difference in Health Care

Health Risk Management, Inc., (HRM) is committed to providing the best in managed health care services to Fortune 500 and government clients internationally. We are seeking an experienced senior systems analyst to work in our highly responsive production and development environment.

As senior systems analyst, you will perform as a team leader in a significant development project supporting HRM's key business objectives.

If your background includes:

- 5+ years of FOCUS experience
- 10+ years of system development experience
- Strong analytical skills
- VM/CMS experience a plus

and you are one of the best... we want you to join our team!

HRM offers a competitive salary and benefit package including flexible paid time off and a 401(k) plan.

Please send your resume and salary history. No agencies, please.



Health Risk Management, Inc.  
8000 W. 78th Street, Minneapolis, MN 55439  
(612) 828-3772  
Equal Opportunity Employer

## PROGRAMMER/ ANALYST POSITIONS SYSTEMS PROGRAMMERS

With at least 3 years experience in

- IMS DB/DC, DL1
- NATURAL
- PL1
- DB2/SQL
- VM/VS
- VAX/VMS
- FOCUS
- CICS
- ADABAS
- COBOL
- TANDDEM
- RPG/III
- IDS/ADS/O
- C LANGUAGE

Please Send Resume to:

**MSI Management Solutions, Inc.**  
1416 South  
Third Street,  
Louisville, KY  
40208  
502-634-1387

OP STAFFING SINCE 1969

## BRIDAL CONNECTION

Analyst IEP Alabama ... To 80K  
Mgr Data TCP/IP LAN ... To 50K  
DBA DB2 ... To 45K  
VAX SYS Mgr - Cluster ... To 45K  
SIA MIS or DB2 ... To 45K  
SIA VAX Cobol - Mgr ... To 45K  
P/A MVS IDS/ADS/O ... To 45K  
P/A MSA GL ... To 37K  
DBA IDS ... To 40K  
P/A MVS Cobol ... To 38K  
S/P A MVS HPS ... To 45K  
P/A MVS Cobol CICS ... To 38K  
P/A IDS CICS ... To 40K  
P/A MVS IDS DB/DC ... To 38K  
P/A HP ASK Fortran ... To 38K  
P/A ORACLE SQL ... To 40K  
P/A FOCUS DB2 ... To 38K  
P/A MVS Cobol DCS ... To 38K

Call Russell Brey, CPC  
or Cindy Swain  
AVAILABILITY, INC.  
Dept. C, P.O. Box 25434  
Tampa, Florida 33622  
813-286-8500  
FAX 813-286-0574

## Opportunities at RUBBERMAID

Rubbermaid Inc., one of Fortune 500's most admired companies and growing at a 15% annual rate, has 3 immediate outstanding growth opportunities with our Commercial Products Division Headquarters in Winchester, Virginia.

### CIM PROJECT LEADERS

Will analyze and evaluate existing or proposed manufacturing systems and define solutions to satisfy business needs. Major responsibilities will include: leading the systems effort for several major components of Rubbermaid Commercial Products CIM (Computer Integrated Manufacturing) as part of a cross-functional team; define the requirements for the division CIM project by reviewing existing policies and practices and simplifying those activities to the essential elements; evaluate and select from alternative solutions the best fit for the division's short and long term requirements; define, design, and implement the chosen systems in coordination with cross functional user groups as part of an integrated business systems plan. Requirements include: Bachelors Degree in Computer Science or Business; 10 years experience in applications development with a background in Cobol and CICS; 7 years experience with large scale computer systems with an emphasis on IBM; 5 years experience in manufacturing and distribution systems (MRP, DRP) analysis, design, development and implementation; 3 years of Project Management experience.

If you want to play a key role in our ambitious growth, forward your resume with salary requirements to:

**SEAN P. GILLESPIE  
RUBBERMAID COMMERCIAL  
PRODUCTS, INC.**  
3124 Valley Avenue  
Winchester, VA 22601

Equal Opportunity Employer



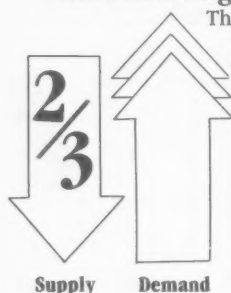
# A few important tips on recruiting computer professionals

**F**inding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

## The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better — and that's sure to make your recruiting tougher in the '90s.

## Ads in local papers don't reach your major hiring market anymore

That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who



would consider new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that

reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

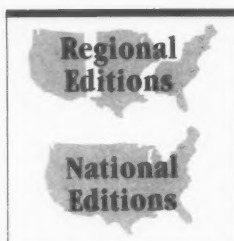
## More job seekers see your ad in Computerworld than in any other newspaper — Sunday, daily, or trade

That's because *Computerworld* reaches over 612,000 qualified computer professionals every week — the largest audience of its kind, and one that's rich with passive and active job seekers.

That's why more companies advertise more jobs in *Computerworld* than in any other professional newspaper. And why *Computerworld* is the *single place* where America's computer professionals *expect* to see the most jobs every week.

## Computerworld gives you regional editions

A key option when you need a regional candidate and want to avoid national response and relocation. Yet if your search is national in scope, *Computerworld* can also give you more widespread national exposure than any other source.



## Computerworld needs just 3 working days for your ad to appear

That's comparable to most local newspapers. And why your ad can quickly appear in the next issue to start generating quality response.

## Computerworld costs no more than local papers

And with a regional line rate of just \$10.80, your cost-per qualified candidate reached is better than *any* newspaper — Sunday, daily or trade. Or just about any other source, for that matter.

## Computerworld leads candidates to your ad

Just look at this week's Computer Careers section. You'll find a career editorial topic that will stir the interest of virtually any computer job seeker — passive or active. It's just one of countless reasons *Computerworld* is America's newspaper of choice on computing. No matter how much the times change.

And while times may change, some things won't. Whether you *use* computers, *make* computers, or *sell* products and services for computers, *Computerworld* is still your major source of news today. And your major source of computer professionals tomorrow.



For more recruiting tips, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).



**Weekly. Regional. National.  
And it works.**

For every 10 of today's computer job seekers...	
2 are Active	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
7 are Passive	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
1 is a Non-mover	<input type="checkbox"/>







**"...Based on number of leads per dollar invested, I always win with Computerworld Response Cards."**

— Paul D. Boone  
President  
Stile Software Company

Paul D. Boone, President of Stile Software Company, distributes OUTBOUND, an amazing new file transfer system developed by Firesign Computer Company of San Francisco. His start-up company, based in Orford, New Hampshire, is relying on Computerworld Direct Response Cards to help expand its customer base throughout the United States and Canada.

*"OUTBOUND" is unique in that it transfers files directly between PCs and a mainframe in one easy step, without having to depend on or even involve the end users.*

*Since it's initiated and controlled by the mainframe, files can be transferred at any time — day or night. In fact, as long as the PC is turned on, can communicate with the host, and is running OUTBOUND under MS-DOS, OUTBOUND can go right to work. It's so productive that it even lets the end users run other applications on their PCs while the host is transferring data back and forth. The central site can transport files to and from the users without having the end users do anything. It just can't get any easier than that.*

*"Now it's my job to show potential buyers what this 'ultimate user-friendly' system can do for them. Specifically, I'm targeting applications development managers and info center managers in larger companies with distributed computing environments. My goal is to get the OUTBOUND message out to lots of people quickly, easily, and economically. So I chose Computerworld Response Cards.*

*"And it was the right choice. I was extremely impressed with the number of inquiries I received very quickly — calls actually started coming in the very first day. My advertisement in the August Computerworld Response Card deck alone generated over 300 good leads. In following up, I've already installed a number of OUTBOUND systems under our 30-day "No Hassle" Free Trial Program. And that's good news for me, since typically 80% of all OUTBOUND trials result in sales.*

*"Converting leads into sales — economically — is the backbone of my business. Here, based on cost per reader and number of leads per dollar invested, I always win with Computerworld Response Cards. And to keep on winning next year, I plan to double my frequency schedule in Computerworld Response Card decks."*

Computerworld Direct Response Cards give you a cost-effective way to reach Computerworld's powerful buying audience of over 134,000 computer professionals. Every month. Call Norma Tamburrino, National Account Manager, Computerworld Direct Response Cards, at (201) 587-0090, or (201) 587-0297 to reserve your space today.



**COMPUTERWORLD  
DIRECT RESPONSE CARDS**



# MARKETPLACE

## Superstores muscling in on resellers' territories

BY ALICE LAPLANTE  
SPECIAL TO CW

Just as mom-and-pop grocery stores shudder when large supermarket chains move into their neighborhoods, traditional personal computer resellers flinch when a 30,000-sq-ft Soft Warehouse or Micro Center sets up shop nearby.

Called "category killers" because of their propensity to ruthlessly eliminate less-efficient competitors, computer superstores deliver the largest selection of hardware, software and peripherals at the lowest possible cost to the buyer.

"What is happening in our industry is an accelerated microcosm of what has happened in virtually all other industries," says Seymour Merrin, president of Information Resources in Palo Alto, Calif.

The basic premise of a superstore is identical, regardless of the type of product sold. A large warehouse is filled with every imaginable product from virtually every vendor in the business.

Because of low overhead costs and tightly controlled inventory, superstores offer substantial savings to their customers, ranging from 40% to 80% off retail prices. Even for the heavily discounted PC industry, these are numbers to be reckoned with.

Superstores also market aggressively, spending tens of millions of dollars in ad-

vertising campaigns designed to get consumers into the stores and spur them into as much of a buying frenzy as is possible. Again, such a strategy has more in common with tactics used by mass merchandisers such as Sears, Roebuck and Co. and K Mart Corp. than Businessland, Inc. Computerland Corp. or Microage, Inc. — but it is working, nonetheless.

"The traditional computer store is no longer feasible," says Rob Howe, marketing vice-president at Computer Bay, a Milwaukee-based franchiser of PC retailers. Computer Bay franchises have seen a major impact on their business when superstores have moved into their markets.

### Superstores expand

Currently, no one superstore chain dominates coast to coast. Soft Warehouse, based in Dallas, is the most rapidly expanding organization, with 13 stores currently open and 20 more slated for opening by the end of 1991; Micro Center, based in Columbus, Ohio, now has three superstores; and Silicon Valley superstore pioneer Fry's Electronics just opened its third superstore in Palo Alto, Calif., and is expected to venture out of the Northern California region soon.

Computer resellers have seen the

writing on the wall for some time. Long gone are the days when corporate customers would buy all their PCs, applications software, printers, cables and disks from one location. Fierce discounting has put many dealers in untenable financial positions. To meet competition, they have to cut prices but still stay in business; to stay in business, they need to sell more equipment; to sell more equipment, they need to cut prices even further.

A look at the once-flourishing Businessland is a case in point. Once one of the country's largest and most successful resellers, Businessland has lately fallen on hard times, reporting a \$21.5 million loss last quarter (CW, Aug. 13) and laying off 10% of its work force a month later.



### All is not lost

It is possible for a reseller to survive without going the superstore route. Dataflex Corp., a value-added reseller based in Edison, N.J., concentrates on providing Fortune 1,000 companies in the New York metropolitan area with a wide range of products and services. Richard Rose, president and chief executive officer of Dataflex, says that if a customer is only interested in the lowest price, he walks away from the sale. "We decided eight months ago that we didn't want to compete in that market," Rose says. Dataflex managed to boost its net income for the quarter ending June 30, 1990, by 45% over the corresponding quarter last year, while its total revenue grew only 5%.

Merrin calls reseller outfits such as Dataflex "boutiques" because they ap-

peal to a certain kind of corporate customer — one that is willing to pay the price for significant value-added services. However, although many reseller chains have paid lip service to that idea, few actually deliver. Merrin and others believe that when the dust settles in the PC reseller channel, there will be two kinds of survivors: superstores and boutiques.

Superstores have not yet completely won the battle. Many such organizations suffer from the stigma of not carrying the "Big Three" computer names dear to the hearts of corporate America: IBM, Compaq Computer Corp. and Apple Computer, Inc.

All three vendors, which rely heavily on their authorized resellers, are loath to offend their own resellers by endorsing what are, in effect, discount houses. However, Merrin and others predict that this will change shortly. "As their own dealers start dying off, they will have no choice," Merrin said.

Furthermore, superstores are criticized as being oriented to the individual consumer rather than the corporate customer. Proponents of this view argue that corporations require much more sophisticated services than superstores could hope to provide.

The superstores themselves argue that there shouldn't be a mystique about their success. "Anyone who has a good relationship with their customer doesn't have to worry about us," says Soft Warehouse President Nathan Morton, a former executive of do-it-yourself building supply superstore Home Depot.

LaPlante is a free-lance writer based in Palo Alto, Calif.

## Buy/Sell/Lease

### The BoCoEx index on used computers

Closing prices report for the week ending October 19, 1990

	Closing price	Recent high	Recent low
IBM PC Model 176	\$325	\$660	\$200
XT Model 086	\$450	\$550	\$350
XT Model 089	\$500	\$725	\$400
AT Model 099	\$600	\$1,075	\$500
AT Model 239	\$775	\$1,025	\$700
AT Model 339	\$925	\$1,300	\$900
PS/2 Model 30-286	\$1,250	\$1,300	\$1,125
PS/2 Model 60	\$1,500	\$1,800	\$1,400
PS/2 Model 70P	\$3,375	\$3,400	\$3,175
Compaq Portable II	\$975	\$1,050	\$875
Portable 286	\$1,275	\$1,450	\$1,100
SLT 286	\$2,600	\$2,625	\$2,000
Portable 386	\$2,600	\$3,000	\$2,500
LTE 286	\$2,000	\$2,100	\$1,850
Deskpro 286	\$1,375	\$1,400	\$1,200
Deskpro 386/20	\$2,900	\$3,100	\$2,400
Apple Macintosh Plus	\$750	\$1,075	\$700
SE	\$1,250	\$2,050	\$1,200
II	\$3,100	\$3,400	\$3,050
IIFX	\$6,600	\$7,100	\$6,600

INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

**ICE-BUYS**  
INTERNATIONAL COMPUTER EXCHANGE, LTD.  
1-800-ICE-BUYS  
digital  
Data General  
sun  
apollo  
IBM  
PC/AT/PS2  
CALL TODAY FOR QUOTE  
1-800-ICE-BUYS  
INTERNATIONAL COMPUTER EXCHANGE, LTD.  
TEL.: (617) 585-8888 • FAX: (617) 585-8177  
• 183 MAIN ST. • KIDSTON, MA 02364 •

**Industrial Electronics**  
We buy and sell all types of industrial electronic equipment. We are now looking for qualified individuals to sell our equipment. For all your industrial electronic equipment needs, call us today. We are the largest industrial electronic equipment dealer in the world.  
TEL: (617) 585-8888  
FAX: (617) 585-8177

### COMPUTER ROOM EQUIPMENT

#### LIEBERT

Computer Room Air Conditioners  
3 thru 22 Ton Units  
Main Frame Chillers  
3 thru 12 Ton Units  
Power Distribution Units  
30 thru 225 KVA

#### PILLER

40 & 75 KVA Silentblocks

LIEBERT, EXIDE, EMERSON  
EPE & IPM

18.75 - 556 KVA UPS Systems

#### RAISED ACCESS FLOORING

Thousands of square feet in stock, wood and steel.

All items listed are reconditioned with warranty

**dp support**  
P.O. Box 1408  
Piano, TX 75086  
214-422-4551  
214/578-1236 Fax

### COMPUTERWORLD CLASSIFIED MARKETPLACE

Examines the issues while computer professionals examine your message. Call for all the details.  
(800)343-6474  
(In MA, 508/879-0700)

# CLASSIFIED

## Buy/Sell/Lease

**IBM** **SYSTEM 36/38** **4300** **4300**

**SERIES 1** **SYSTEM AS/400**

**SPECIAL LEASE RATES ON AS/400's**

• Buy • Sell • New • Used

**NEWPORT LEASING, INC.**  
(800) 6789-1811

200 Washington St., Suite 100, Boston, MA 02108  
781-426-8470 FAX 781-426-8200

• Equipment Conditioned To Your Requirements • All CPU Upgrades • IBM Workstation Maintenance Contracts • IBM Terminals • IBM Peripherals • IBM Printers • IBM Modems • IBM Telephones • IBM Fax Machines • IBM Terminals • IBM Peripherals • IBM Printers • IBM Modems • IBM Telephones • IBM Fax Machines

**Great Deals on WANG PCs**

- Custom configurations for LAN networking
- Most models in stock for immediate delivery
- Wang 300 and 400 series, workstations, printers, peripherals, Wang-compatibles
- Other PCs: IBM, Epson, HP, NEC, Arche, AST, Zenith, Toshiba, others...

**SAVE 50% on WPB-Refurbished** WANG VS, OIS, Printers, and Peripherals  
Guaranteed acceptable for the WANG Service Contract

**1-800-223-9264**

**WUPB**  
AUTHORIZED WANG PC DEALER  
\*New Wang PCs sold in Wang's Eastern Zone and Southern California only. 8 Sales Offices Member WIDA

**VAX RENTALS**

**MV 3600**  
**VAX 6000/3900**  
**VAX 6000 SERIES**  
**VAX 6000 SERIES**  
**Systems & Peripherals**

- Fast Turnaround
- Dependable Products
- Upgrade/Add-On Flexibility

• 6 Months • 12 Months • 24 Months

**BROOKVALE ASSOCIATES**

**EAST COAST** (516) 273-7777  
**WEST COAST** (206) 392-9878

## Advertise Your Products In The

### Classified Marketplace

#### Featuring

- ☐ Hardware
- ☐ Software
- ☐ PC Products
- ☐ Conversions
- ☐ Time/Services
- ☐ Buy/Sell/Lease
- ☐ Communications
- ☐ Peripherals/Supplies
- ☐ Business Opportunities
- ☐ Bids/Proposals/Real Estate
- ☐ Graphics/Desktop Publishing

Reach over 612,000 information systems professionals by placing your company's message in

#### Classified Marketplace.

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

State: \_\_\_\_\_ Zip: \_\_\_\_\_

Telephone: \_\_\_\_\_

Ad Size: \_\_\_\_\_ columns wide x \_\_\_\_\_ inches deep.

☐ I am enclosing ad material with this form.

Return this form and advertising material to:

**COMPUTERWORLD**  
Classified Marketplace  
375 Cochituate Road, Box 9171  
Framingham, MA 01701-9171

**(800) 343-6474**  
(In MA., (508) 879-0700)



**COMPUTERWORLD**  
Where all computer buyers and sellers go to market.

## SPECTRA EQUIPMENT CORPORATION

(714) 970-7000 (800) 745-1233 (714) 970-7095 FAX

### BUY SELL RENT LEASE

#### IBM digital XEROX

<b>ANAHEIM CORPORATE CENTER</b>	9370, 4381	MicroVax	2700
5101 E. La Palma Ave.	AS400, S/36, S/38	VAX 6000	3700
Suite 206	Point of Sale	VAX 8000	4050
Anaheim	CAD/CAM		4090
California 92807	Series/1	PROCESSORS	8700
LOS ANGELES	Banking	PERIPHERALS	9700
SAN JOSE		UPGRADES	
SEATTLE			

*Integrity... the Spectra difference!*

A full line IBM and Digital computer dealer

### IBM SPECIALISTS

SELL • LEASE • BUY  
S/34 S/36 S/38 AS/400  
3741 3742

- \* New and Used
- \* IBM Maintenance Guaranteed
- \* All Peripherals
- \* Immediate Delivery
- \* Upgrades and Features
- \* Completely Refurbished

800-251-2670

IN TENNESSEE (615) 847-4031



COMPUTER MARKETING

of America, Inc.

PO BOX 71 • 610 BRYAN ST. • OLD HICKORY, TN 37138

### HONEYWELL

LEVEL 6 DPS 6

SERIES 16

- Complete Minicomputer Line - New & Used
- All Peripherals & Terminals
- Upgrades and Features
- Depot Repair Capability
- Honeywell Maintenance Guaranteed
- Immediate Delivery Low Prices
- HDS 5 and HDS 7 Compatible Terminals
- The Recognized Leader in Honeywell Minicomputer Sales and Support.



BOUDREAU COMPUTER SERVICES

100 Bearfoot Road  
Northboro, MA 01532  
(508) 393-8839  
FAX 508-393-3761

"Since 1974"

### Buying Selling

**DEC - SUN**  
Data General  
Plus  
All Peripherals

Call DCC  
617-837-7255  
OR  
301-750-7200

### PRIME

EXPERIENCED SYSTEMS AND PERIPHERALS

BUY-SELL-LEASE BROKERAGE

NEW PLUG-COMPATIBLE DISK, TAPE, MEMORY

PLUS THE FASTEST I/O AVAILABLE ANYWHERE

1ST SOLUTIONS, INC.  
11480 N. CAMELBACK RD.  
PHOENIX, AZ 85020  
ASK FOR DON SHIPPS  
602-997-0997  
FAX: 602-997-1688



### FOR SALE

FPS Computing System

Model 64/164

Will configure with Disk, Memory & Max. Boards to meet your needs. Other FPS Computing Systems available

International Computing Systems

800-522-4272

Fax: 612-935-2580

### Mini-Computers & T-Bar Switches For Sale

Bull DPS6's

Quantities and details supplied upon request. No reasonable offer refused.

Fax #714) 474-5793

Attn: Binnie Larson

### CLASSIFIED MARKETPLACE

Where Computer Professionals Shop

(800) 343-6474

(In MA, 508/879-0700)

### WANTED

4381-13 ANY SIZE

Blue Bonnet Computer Corp.

512/926-3900

### FOR SALE OR LEASE

DEC VAX 6410

\$175,000

1 Year Warranty

Digital Computer (713)

Resale 445-0062

Your used computer equipment deserves a second chance.

If you have used computer equipment to sell, Computerworld's Classified Marketplace is the best place to do your selling. That's because the Classified Marketplace features a Buy/Sell/Lease section to help you market your equipment to the very people who are looking to buy.

And when you advertise in Computerworld Classified Marketplace, you reach a total (ABC-audited) audience of over 612,000 computer professionals who turn to Computerworld for news, information, features - and the Classified Marketplace - every week.

So give your used computer equipment a second chance today.

To reserve your space, call:

800/343-6474

(In MA, 508/879-0700)

**9370**

**IN-HOUSE TECHNICIANS**

**Buy Sell Lease**

**SSI**

**simon systems inc.**

**CALL 1-800-345-9370**

**Associates Inc.**

- Data General
- Fujitsu
- Data Products
- CDC
- Printronic
- Zetaco

**BUY SELL TRADE**

**617/862-9664**

**FAX: 617/871-4486**

**Buying Selling**

**DEC - SUN**  
Data General  
Plus  
All Peripherals

Call DCC  
617-837-7255  
OR  
301-750-7200

Buy/Sell/Lease

**FOR IMMEDIATE SALE  
UNISYS EQUIPMENT**

EQUIPMENT LISTED BELOW DEINSTALLED ON 9-30-90

STYLE	DESCRIPTION	QTY
V-380 (CERTIFIED)	10 MEG. CPU	1
CP3682-P (CERTIFIED)	DATA COMM PROCESSOR	1
CP3645-1 (CERTIFIED)	I/O EXPANSION UNIT	1
T27-12P	CONSOLE SPO	1
B8245-5	600LPM PRINTER	1
B8387-42	DISK CONTROLLER	2
B9410	BASIC SWITCH CABINET	1
B9410-1	SWITCH RELAY MOD.	2
B9494-4	400MB-207	3
B9495-24	MTU 1250/320 KB 200PS	2
B9499-21	1XB GORP/PE CONTROLLER	1
B9484-5	130MB-205	1
B3387-5	BASIC DISK PACK EXCHANGE	1

SUBMIT OFFERS TO:  
MAILING ADDRESS: RONALD VALERIAN, 305-770-2190  
AMERICAN SAL, 17801 N.W. 2ND AVENUE  
MIAMI, FL 33168, ATTN: R.M. VALERIAN  
FAX# 305-770-2440

**RENT RIGHT FROM THE SOURCE.**

High-quality datacomm products from Codex

In-stock products  
shipped within  
24 hours!

Modems — V.32, dial, leased line

Multiplexers

DSUs/CSUs

And much more

Why hesitate?

Call us for a quote

**800-446-6336**

Fax: 508-261-7105

- Rent direct from Codex and you'll have valuable equity later if you choose to purchase
- All of the versatility, quality and reliability you've come to expect from today's leading datacomm supplier
- Full Codex warranty and nationwide service - installation also available
- Flexible payment options - check, charge, P.O., or C. O. D.

**CODEx EXPRESS**

**Prime**

Experienced  
Systems  
New & Used  
Peripherals  
Worldwide Service  
Buy - Sell - Lease

OTW, Inc.  
305 Union St  
Franklin MA 02038  
508-520-0250

**HP HP HP HP**

NEW and USED  
1000 • 3000 • 9000  
Including Spectrum

BUY • SELL • TRADE • RENT • LEASE  
Processors • Peripherals • Systems

All in Stock - Immediate Delivery  
All warranted to qualify for manufacturer's maintenance

ConAm Corporation

It's Performance That Counts!  
800/643-4954 213/829-2277  
FAX 213/829-9607

**ANOTHER  
REASON WHY  
COMPUTERWORLD  
MARKETPLACE  
PAGES WORK ...**

Computerworld's Classified Marketplace gives you 51 opportunities to advertise in 1990 - and needs as little as 3 working days notice before each Monday issue to run your advertisement!

Mon.	Tues.	Wed.	Thu.	Fri.
	Space Res Close	Mats Close	1	2
Issue Date			3	

To place your ad, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).



**COMPUTERWORLD**

Where all computer buyers and sellers go to market.

**DEC EQUIPMENT  
FOR SALE**

System #1  
11/84-BA with 4Mb memory.  
TUBO-AA 1800 bpl tape drive.  
RUA81-AA 405Mb DSA disk drive  
with controller.  
RUA80-CA 202Mb DSA disk drive  
with cabinet.  
3 DHU-11 16 port multiplexers  
with distribution  
panels and cabinet  
kits. 48 ports total.  
RSTS/E, BasicPlex 2, &  
DECWord Licenses

Note: The 11/84 processor is in the  
RUA80 cabinet.

Price: \$9,300.00 or make an offer

System #2  
11/84 op with 2Mb memory.  
TUBO-AA 1800 bpl tape drive.  
RUA81-AA 405Mb DSA disk drive  
with controller.  
2 DHU-11 16 port multiplexers  
with distribution  
panels and cabinet  
kits. 32 ports total.  
RSTS/E Licenses

Note: This system has no cabinet  
for the 11/84 processor.

Price: \$8,000.00 or make an offer

All equipment is guaranteed for  
3 years maintenance and  
installation. All cables etc. are  
included. Both processors are up to  
current revision levels and will run  
RSTS/E. Prices do not include  
shipping.

Will consider selling individual  
components or reconfiguring systems.

Call 1-305-425-6261 ext. 132 ask  
for Jeff Owen

**COMPUTER  
MAGNETIC TAPES**

For Sale

10,000

2400 foot

Certified

Best Offer

Contact

Bill Winkel

**Data General**

- Large inventory of new & used DG equipment available
- Complete systems & spare parts for Nova & MV systems
- Also new Plug-Compatible Disk, Tape & Printers
- World-wide Service

Buy-Sell-Lease-Rent

International  
Computing Systems

**800-522-ICSC**

Fax: 612-935-2580

**New/Reconditioned  
Equipment**

Whatever your requirements are for Digital Equipment, call CSI first! Buying, selling, trading, leasing, consignments - we do it all!

CSI sells all equipment with a 30 day unconditional guarantee on parts and labor and is eligible for DEC maintenance.

Offering systems, disk drives, tape drives, printers, terminals, memory, options, boards, upgrades and many more.

CSI Computer Systems, Inc.  
83 Eastman St.  
Easton, MA 02334  
Call Toll-Free 1-800-426-5499  
In Mass. (508) 230-3700  
FAX (508) 230-9250

**CALL US LAST**

GET YOUR BEST PRICE  
THEN CALL  
**COMPUTER BROKERS, INC.**  
WE  
Buy - Sell - Lease  
New and Used IBM Equipment  
AS400 - System 36, 38, 43XX  
**SHORT TERM RENTALS**  
Call 800-238-6405  
IN TN 901-372-2622  
**COMPUTER BROKERS, INC.**  
2976 Shelby St., Memphis, TN 38134  
'Since 1974'

Buy Sell  
Lease Rent  
Currently replacing Series/1's  
with the new RS/6000 line via  
EDX to AIX migration  
**612-942-9830**  
**DATATREND**  
10250 Valley View Road  
Suite 100  
Eden Prairie, Minnesota 55331

**IBM**  
BUY SELL  
LEASE  
PS/2 OPERATING  
LEASES  
3084 3090  
PERIPHERALS  
OEM/PCM  
LEASES  
**800-888-7568**  
FAX 214/763-1379  
Member  
COLA  
EST.  
1978

**WE  
BOUGHT  
IBM®**

By the thousands.

As a result of our thousands of purchases of new and used IBM systems of all sizes, shapes and descriptions, we are offering you great savings on IBM AS/400's, 36's, tapes, drives, printers and peripherals, as well as all upgrades.

As a specialty, we offer multiplexors, modems, protocol converters and PS/2's.

If you have a need to buy or sell, call us first and DEAL DIRECT with the...

**COMPUTER  
MARKETPLACE**

**800-858-1144**

In CA, dial (714) 735-2102, 205 East 5th Street, Corona, CA 91719

IBM IS A REGISTERED TRADEMARK OF INTERNATIONAL BUSINESS MACHINES, INC.

**WANG**

Buy-Sell or Trade  
VS PC OIS

Systems in Inventory  
VS 7000 / 100 / 85 / 65 / 6 / 5

And Peripherals  
4230A • 4230 • Laser Printers  
PC/386x Workstations

**Genesis Equipment Marketing**

Phone (602) 948-2720 Fax (602) 948-0615



## CLASSIFIED

### Conversions

#### CONVERSION EXPERTS

Family of integrated software tools that automate the following conversions:

- DOS to MVS
- DOS/MVS to AS/400
- Honeywell to IBM
- CICS Macro to Command
- Any Cobol to Any Cobol
- Basic to Cobol

Products & services on your site or ours. Fixed fee or T&M.



**NEOSYNETICS, INC.**  
2860 Des Plaines Ave., Suite 375  
Des Plaines, Illinois 60018  
708/299-0900 Fax: 299-6044

#### Automated Conversions to AS/400

from

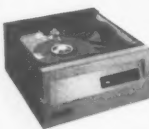
1. IBM MAINFRAMES, CICS & Batch COBOL. Up to 65% cheaper/75% quicker than manual conversion. Industry proven.
2. NON-IBM, Wang, Unisys, Honeywell, etc.
3. PAPER DOCUMENTS. Imaging Systems on PCs and/or AS/400. Call for details.

**CSI Inc.**

150 Lafayette Street, Suite 800, NYC, NY 10013  
Phone: (212) 431 4084 • Fax: (212) 431 4109

### Peripherals/Supplies

#### 9-Track Tape For Your IBM PC/XT/AT/PS-2™



Read 1600 or 6250 bpi  
9-track tapes from a micro,  
mini or mainframe in EBCDIC  
or ASCII as mirror image or  
by individual files.  
Use the 2000 PC™ for  
disk backup, data inter-  
change or archival storage.  
PC/XT/AT/PS-2 are trademarks of IBM.



**First In Value**  
**DIGI-DATA CORPORATION**  
8580 Dorsey Run Road  
Jesup, MD 20794-9990  
(800) 782-6395  
FAX (301) 488-0771

#### COMPUTERWORLD

##### Classified Marketplace

delivers your  
message in  
companies that  
plan to buy  
your product  
or service.

From PCs to minis,  
mainframes to super-  
computers, Comput-  
erworld's readers buy  
products across all  
ranges of today's com-  
puters. So if you're sell-  
ing, advertise in the  
newspaper that delivers  
readers that plan to  
buy YOUR product or  
service. Advertise in  
Computerworld's Clas-  
sified Marketplace!

For more  
information, call:

**800/343-6474**  
(in MA, 508/879-0700)

## ANOTHER REASON WHY COMPUTERWORLD'S MARKETPLACE PAGES WORK ...



Computerworld is the only computer publica-  
tion to give readers an established classified  
advertising resource for over two decades!  
And since Computerworld has been the  
weekly computer newspaper of choice since  
1967 - that means Computerworld's loyal  
readers will expect to see your classified  
message in Computerworld's Marketplace  
Pages!

To place your ad, call John Corrigan, Vice  
President/Classified Advertising, at **800/  
343-6474** (in MA, 508/879-0700).

#### COMPUTERWORLD

Where all computer buyers and sellers go to market.

### Software

#### KeyEntry III

PC-BASED DATA INPUT SOFTWARE

REPLACE DEDEDICATED DATA ENTRY SYSTEMS  
FRONT-END MAINFRAME APPLICATIONS

- ✓ LAN or stand-alone environments
- ✓ Two-pass verification
- ✓ Batch balancing and check digits
- ✓ Operator statistics reporting
- ✓ Embedded numeric keypad emulation
- ✓ Extensive field edits and table lookups
- ✓ Screen Painter and MenuManager included
- ✓ Batch Control System and Reformat utility
- ✓ User-definable help screens and windows
- ✓ OS/2 version
- ✓ Outstanding customer support
- ✓ Thousands of users worldwide
- ✓ French, Spanish, and German versions
- ✓ Consulting, conversion and integration services

FREE evaluation systems available for  
qualified companies.

**1-800-533-6879**



**SOUTHERN COMPUTER SYSTEMS, INC.**  
2732 Seventh Avenue South • Birmingham, AL 35233  
PHONE: (205) 251-2985 • FAX: (205) 322-4851

### Bids/Proposals/Real Estate

#### MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received  
by the CPDA, 301 N. Lamar St.,  
301 Building, Suite 508, Jackson,  
MS 39201 for the following equip-  
ment and services:

**Request for Proposal No. 1880,**  
due Tuesday, November 13,  
1990 at 3:30 p.m. for the acqui-  
sition of a UNIBASE 30-graphics  
workstation for the UNIVER-  
SITY OF MISSISSIPPI.

**Request for Proposal No. 1881,**  
due Monday, November 12, 1990  
at 3:30 p.m. for the acquisition of a  
Tape Backup Unit and various  
other peripherals for use with the  
Wang VS 5460 minicomputer of the  
MISSISSIPPI PUBLIC SER-  
VICE COMMISSION.

**Request for Proposal No. 1882,**  
due Thursday, November 15,  
1990 at 3:30 p.m. for the acqui-  
sition of a 2.0 GB disk subsystem  
for an existing Data General MV/7800  
computer for MISSISSIPPI  
STATE UNIVERSITY.

**Request for Proposal No. 1883,**  
due Wednesday, November 7,  
1990 at 3:30 p.m. for the acqui-  
sition of an upgrade of a Data Gen-  
eral MV1800 minicomputer for the  
MISSISSIPPI DEPARTMENT OF  
ECONOMIC AND COMMU-  
NITY DEVELOPMENT.

Detailed specifications may be  
obtained from the CPDA office.  
The CPDA reserves the right to  
reject any and all bids and pro-  
posals and to waive informalities.

Patsy Stansbury @ (801) 358-2804

It's the

#### Classified Marketplace

Reach Computer  
Professionals  
Where They  
Shop For:

- ☐ Buy/Sell/Lease
- ☐ Hardware
- ☐ Software
- ☐ Peripherals/Supplies
- ☐ Communications
- ☐ Graphics/Desktop Publishing
- ☐ Time/Services
- ☐ Bids/Proposals/Real Estate
- ☐ Business Opportunity

**CALL NOW**

**800 343-6474**  
(in MA, 508/879-0700)

#### Financial Technologies

**Innovative, Responsive,  
Quality**

a few words that describe  
the most complete  
computer processor  
offering....

IBM 3090, MVS/XA,  
MSA, DB2, VM/HPO,  
TSO, CICS/VSAM  
and a multitude of  
third party software

the complete source for  
... outsourcing ...

**1-800-443-8797**

14300 Sullyfield Circle  
Chantilly, Virginia 22021

#### REMOTE PROCESSING

#### PERSONALIZED SERVICE

- Guaranteed Service Levels
- Peak Load Processing
- Satellite Communications
- Fixed Pricing
- Disaster Recovery Services
- Printing & Mail Services
- VM/XA, MVS/XA, DOS/VSE



**Agway Data Services Inc.**  
Call 1-800-ADS-7112

"Committed to Customer Satisfaction"

### Time/Services

#### SUNGARD

COMPUTER SERVICES

OUTSOURCING EXPERTISE

FIXED PRICE COMPUTING

ECONOMICAL PRICES - SIGNIFICANTLY LESS THAN  
IN-HOUSE

IBM 3090 COMPUTERS WITH MVS/ESA, AND VM  
TECHNOLOGY

EXTENSIVE NATIONWIDE TELCOM NETWORK

EXTENSIVE LIBRARY OF THIRD PARTY SOFTWARE

PROFESSIONAL SERVICES FOR APPLICATION  
SUPPORT & DEVELOPMENT

FOR MORE INFORMATION CALL:  
(800) 441-4203 (215) 387-3800  
(212) 943-9540

**SUNGARD COMPUTER SERVICES INC.**  
1286 DRUMMERS LANE  
WAYNE, PA 19086

#### OUTSOURCING AND REMOTE COMPUTING

- IBM MVS/XA Environment
- DB2, IMS/RS, Model 204 and 4GLs
- Professional Support Staff
- Experienced Migration Management Team
- Simplified Pricing and Invoicing
- AS/400
- Full Supporting Services
- Media Conversion
- Laser & Impact Print Facility
- Application Programming
- Technical Support
- 24 Hours a Day - 7 Days a Week

#### May & Speh, inc.

1501 Opus Place, Downers Grove, IL 60515-5713  
**(800) 729-1501**  
For More Information Contact: Tony Ranieri

612,000 MIS/DP Professionals see  
the CLASSIFIED MARKETPLACE  
each week.

Call for  
advertising  
information:

**(800) 343-6474**

(in MA, 508/879-0700)



#### COMPUTERWORLD

##### Classified Marketplace

showcases  
your ad by  
product category!

Whether it's used equip-  
ment, software, time, ser-  
vices or just about any  
other category of com-  
puter product or service,  
Computerworld's Classi-  
fied Marketplace is orga-  
nized to make your ad  
visible and to make buy-  
ing your product easy.

**Just look!**

Computerworld's  
Classified  
Marketplace  
Product Categories

software  
hardware  
conversions  
PC products  
time/services  
buy/sell/lease  
communications  
bids/proposals/  
real estate  
graphics/desktop  
publishing  
peripherals/supplies  
business opportunities

So if you're selling com-  
puter products or serv-  
ices, advertise in the new-  
paper that showcases  
YOUR product or ser-  
vice. Advertise in Com-  
puterworld's Classified  
Marketplace!

For more  
information, call

**800/343-6474**  
(in MA, 508/879-0700)



## Time/Services

## Quality Outsourcing

- ♦ IBM Mainframe/Peripherals
- ♦ Full Technical Support
- ♦ 24 hour Help Desk w/ 800#
- ♦ Database Specialists
- ♦ Consulting Services
- ♦ Network Specialists
- ♦ Capacity Planning
- ♦ Automated Operations

**Resources Available Include:**

MVS/XA, VM/XA, CMS, CICS, DB2/QMF, TSO/E, ISPF/PDF, SAS, Librarian, IBM IN, PANVALET, EASYTREIVE, Telenet/Tymnet, TOP SECRET



**Call: (201) 216-3216**

INFORMATION TECHNOLOGY ALLIANCE CORPORATION

## COMPUTERWORLD

**Classified Marketplace**

needs only 3 days notice to run your ad!

**Call:**

**(800) 343/6474**

(in MA: 508/879-0700)

## ICOTECH



MVS/XA TSO/ISPF/SDSF CICS ADABAS LIBRARIAN VTAM FILE-AID INTERTEST SAS \$AVRS DB2 SIMWARE ACF2 ADC2

- 24 hour availability
- International access
- Superior technical support staff
- Uninterrupted Power Supply
- Certified on-site vault
- Disaster recovery
- Impeccable service

Call Now - Solve Your Computing Worries

**TODAY & TOMORROW!**

**(201) 685-3400**

## COMPUTERWORLD

**Classified Marketplace**

**gives you buyers with extensive purchase influence.**

In fact, a full 95% are involved in purchase decision making for their organizations. They determine needs, evaluate technologies, identify solutions, and select products and vendors for the entire range of information systems, as well as related products and services.

So if you're selling computer products and services, advertise in the newspaper that delivers buyers with volume purchasing influence. Advertise in Computerworld's Classified Marketplace!

**For more information, call**

**(800) 343-6474**

(in MA, 508/879-0700)

## COMPUTERWORLD

Where all computer buyers and sellers go to market.

## MCN Computer Services

*is your link to perfection.*

**State-of-the-art IBM compatibility:**

MVS-ESA \* VM/XA \* TSO/E \* ROSCOE \* CICS \* IMS \* IDMS/R \* DB2 \* QMF \* PROFS \*

**Programmer productivity aids:**

FILE-AID \* CICS PLAYBACK \* dBUG-AID \* ABEND-AID \* CICS ABEND-AID \*

(Preceding products are registered trademarks of Compuware Corporation)

MCN Computer Services provides outsourcing solutions to major international clients. With one of the country's finest computer facilities, your data is secure, yet readily available. High-quality, cost-effective services include:

- Remote computing
- Computer outsourcing
- Facility management



**MCN Computer Services, Inc.**

For more information, call Lisa Walker at:

**1-800-521-0444**

5225 Auto Club Drive  
Dearborn, Michigan 48126

**QUALITY COMPUTING SERVICES****PROCESSING & SYSTEMS OPERATIONS**

OUTSOURCING  
FACILITIES MANAGEMENT  
REMOTE COMPUTING / TIMESHARE

**SYSTEMS PLANNING & CONSULTING**

STRATEGIC SYSTEMS PLANNING  
NEEDS ANALYSIS / FEASIBILITY  
QUALITY ASSURANCE PROGRAMS

**PROJECT MANAGEMENT**

PROJECT LEAD / CONSULTANT SUPPORT  
SYSTEMS DEVELOPMENT  
SYSTEM / DATA CONVERSIONS

For more information contact Susan Boush at:  
(206) 924-2527 or (800) 654-9347

Weyerhaeuser  
Information Systems

**REMOTE COMPUTING OUTSOURCING**

• MVS/XA • VM/370 • DOS/VSE  
• CICS • TSO • CMS  
• DB2 • IMS/DBDC

**OVER 150 SOFTWARE PRODUCTS**

• DEVELOPMENT • DEBUGGING  
• PRODUCTIVITY • PERFORMANCE  
• TELENET • TYMNET  
• SEARSNET • IBM INFORMATION NETWORK

**EXTRAORDINARY CUSTOMER SERVICE  
MIGRATION MANAGEMENT**

**GIS** INFORMATION  
SYSTEMS, INC.

815 Commerce Drive, Oak Brook, IL 60521

708-574-3636

New England  
617-595-8000

**OUTSOURCING SERVICES**

IBM MVS/XA • VM/CMS  
TSO • SUPERWYLBUR • CICS • CMS  
Extensive Library of 3rd Party Software

"We offer fixed price solutions"

- Professional Services
- Laser Printing
- Capacity Planning
- Nationwide Network
- 24 Hrs/Day, 7 Days/Week
- Over 25 Years Experience

**COMPUTER NETWORK SYSTEMS, INC.**  
(202) 537-2500

5185 MacArthur Blvd., N.W. • Washington, D.C. 20016

**COST-EFFECTIVE  
COMPUTING SERVICES  
for TODAY and....  
TOMORROW****COMDISCO COMPUTING  
SERVICES CORP.**

Provides you with:

REMOTE COMPUTING  
COMPUTER OUTSOURCING  
FACILITY MANAGEMENT

Featuring:

- IBM® CPUs and Peripherals
- Systems Software:  
MVS/XA, TSO/E, ISPF/PDF,  
CICS, VM/XA, VM/SP, HPO, CMS
- Application Software:  
Database Management  
Application Development  
4/GLs Graphics  
Statistical Analysis
- Multiple Communications  
Methods
- Technical Support
- Automated Tape Handling
- ULTRA-Secure Data Center
- Advanced Laser Printing
- Pricing to fit your needs

Call: Robert Marino  
**201-896-3011**

**COMDISCO**

COMDISCO COMPUTING  
SERVICES CORP.

430 Gotham Parkway, Carlstadt, NJ 07072

# TRAINING

## How you play the game

Content- or skill-based methods: The choice depends on the goal

BY JOEL RAKOW  
SPECIAL TO C/W

**M**ost people don't need to know how a combustion engine works to drive a car. Similarly, most users don't need to know the details of how a system or program works; they just want to put it into gear and go.

On the other hand, auto mechanics certainly need to know the ins and outs of combustion engines. It is necessary that neural network programmers understand all about that technology before daring to "drive" the applications. In the simplest terms, training boils down to what a particular person needs to know to do his job.

Information systems managers can steer their users and staff members in the right direction by deciding which approach is best for each training circumstance.

Two categories that can act as a cover-all in training techniques are content-based training (designed to teach knowl-

edge) and skill-based training (designed to teach skills).

### Content-based training

Content-based training is commonly used in schools. Its goal is theoretical knowledge and understanding of the subject. Because content-based training primarily teaches knowledge, sometimes there is a long period before the student is able to apply that knowledge in a work situation.

Content-based training is ideal for settings in which it has not yet been determined how the information will be implemented. For example, someone being trained to become a manager will have to imagine how to implement the knowledge in unknown situations and under unknown circumstances. Content-based training arms that individual with the information necessary to make educated decisions.

### Skill-based training

In contrast, skill-based training is the best approach for learning specific skills for a specific job. For example, if a manager of billing clerks needs to learn a spreadsheet package that evaluates the efficiency of his department, the skills needed can be taught quickly with a skill-based method because the task at hand is well defined.

With skill-based training, the action is placed at the front of each training episode and the explanation at the rear. Thus, a task that might take days to learn with a content-based approach might be learned in hours with a skill-based method

(see story this page).

Conceptual explanations require approximately 40% fewer words in skill-based training than in traditional content-based training because the explanation follows the experience. By using fewer words and putting the action before the explanation, the rate of learning increases, and the opportunity for misunderstanding and confusion decreases.

### Training grounds

At least half the cost associated with computerizing an organization can be related directly to the cost of training. Thus, choices about skill- and content-based approaches should be made after careful consideration of the issues involved.

Six basic steps of selecting and implementing training are as follows:

- Define the training need, including the content and target audience.
- Identify the minimum performance levels necessary to achieve management goals. Separate the "nice to know" points from the "need to know."
- Select only the "need to know" for the initial training objectives.
- Establish whether a skill-based or content-based approach will best meet your goals, and prioritize training media, from the most desired to the least favored.
- Survey potential vendors of off-the-shelf training products in the desired media. Consider the development of customized training if products don't exist.

• Select and implement training, making sure that management is included to ensure that the new skills will be used in the workplace following the training.

• Monitor the use of the newly learned skills after instruction.

## Case study

Harvard Business School conducted an informal case study comparing skill- and content-based training for learning a specific computer application program.

Professionals who had no previous experience with computers were divided into two groups and given a problem to solve with a spreadsheet program. One group was given a skill-based program designed to teach them to use the spreadsheet program; the other group was given a similar content-based program.

The skill-based group came back with the problem solved in 4½ hours, and the content-based group came back with the problem solved in 8 hours.

Everybody was able to solve the problem, even though they had no prior computer experience and had been given a relatively sophisticated problem. The only difference was that one group accomplished the task in less time.

Used effectively, training — whether skill- or content-based — can be a potent tool to close the technology gap and squeeze that last bit of operating effectiveness out of an organization.

Rakow is the founder and president of Los Angeles-based American Training International, or ATI, a publisher of computer-based tutorials for application software.



**W**hat training issues would you like to see covered? Call Cathy Duffy, associate editor at *Computerworld*, at (800) 343-6474 or fax at (508) 875-8931.

### PREPARE FOR THE "BABY BUST" OF THE 90's

Get Ready for the Staffing Squeeze:

*The smaller work force of the coming "Baby Bust" generation will put a greater emphasis on human resources, and the way that resource is managed will make the difference in the marketplace.*

DuWayne Peterson, Executive VP, Merrill Lynch & Co., *Computerworld*, October 22, 1990

EDUCATION AND TRAINING for your employees benefits your company in three ways:

- ▶ Employees are more effective on the job.
- ▶ Employees stay with the employer.
- ▶ You beat the Baby Bust by attracting other new employees who are well-educated in information/computer management subjects.

Offer your employees and management interns **online** courses/seminars, or certificate programs in Information Resources Management (Information Systems, Services & Technology, Computer Sciences, Telecommunications, and Business Management) through



International School of Information Management  
P.O. Box 1999  
Santa Barbara CA 93116-1999 (800) 441-4746

### MAINFRAME TRAINING

Hands-on, instructor-led training with post training support.

DB2  
IMS  
CICS  
VSAM  
JCL  
TSO  
COBOL  
QMf

Training on-site  
or at facilities  
in Phoenix  
Salt Lake City  
Denver.

RELATIONAL  
TECHNOLOGY  
PROFESSIONALS  
5125 N. 16TH ST. A-112  
Phoenix, Arizona 85016  
(602) 230-7322  
FAX: (602) 230-7358

### Tips & Techniques Developers Handbook NATURAL 2

NATURAL 2 Study Guide  
Inside ADABAS Study Guide  
Introduction to PREDICT  
Introduction to SUPER NATURAL  
XWords™ Cross Referencing Pkg  
WH & O International  
P.O. Box 82-335  
Wellesley, MA 02181  
Tel: (617) 239-0822  
FAX: (617) 239-0827

### Student Signup System

For: Corporate Information Centers / Training Companies

- PC Lan (Multi-User)
- Student Signups
- Invoicing
- Scheduling
- Management Reporting

FREE Demo Disk

Call (819) 460-0071



COMPUTER DECISIONS, INC.  
P.O. Box 80024, Raleigh, NC 27602

## COMPUTERWORLD

November  
Training  
Editorial Topics

**5** How to Evaluate Training  
Product Spotlight:  
Imaging  
Ad Close: Oct 30

**12** Ergonomics and Training  
to Use Better Work Habits  
Executive Report:  
In Pursuit of Productivity  
Ad Close: Nov 6

**Training**

**TeleCommunications Training Monthly**

**VIDEO TAPE**  
Training & Industry News

- X.25 Protocol Analysis
- SDLC/SNA Protocol Analysis
- ISDN BRI "The Basics"
- T1 - Carrier
- Local Area Network Protocols
- DataCom Concepts (RS-232-C)

Call for Demo Tape  
(215) 598-3293

**VIDEO'S THE ANSWER!**  
**\$49**  
**AI, SQL, C, COBOL**  
**TECHINSIDER**

**2170 Broadway Suite 2290**  
**NYC, NY 10024**  
**212 362-0559**

**LEARN LAN on your PC**

**TELETUTOR**

**COMPUTER-BASED TRAINING**  
For FREE catalogue of all our courses call  
**800-542-2242**  
(603) 433-2242

**PROMOTING A BETTER UNDERSTANDING OF INFORMATION ENGINEERING**

CEC is pleased to present the current public offerings of our Information Engineering courses.

Course	Date	Location	Price/Student
IE/Analysis	Nov. 12-14	Los Angeles	\$895.00
IE/Design	Dec. 3-6	Los Angeles	\$1195.00

For more information about our offerings, please contact the CEC Education Coordinator at:

**(313) 569-0900**

**cec**

"The IE Practitioners"

18620 W. 10 Mile Rd. • Southfield, MI 48075-2667

**Call PST for your FREE January-June 1991 Workshop and On-Site Training Schedule**

IMS VSAM SQL TSO/ISPF VM OS JCL COBOL JES2 CA-1, CA-7 & CA-11 REXX CMS

**Operator Skills for OS**

**Preferred Software Training, Inc.**  
524 San Anselmo Ave., Suite 214  
San Anselmo, California 94960  
Phone: 415/457-1054 Fax: 415/454-1416

**Committed Excellence in Training**

**DB2 SYSTEM DESIGN CLASS FEB 29 MAR 1, 1991**

Proven design techniques to unleash the power of DB2

Bring analysts, DBAs, DBAs, and users together SAA, JAD, RAD, transaction processing, normalization, restart, recovery, and more...

FOR INFORMATION CALL  
(213) 374-3846

**SPL EDUCATION**

**AS/400**  
*Hands-on training at client site.*

- Relational database
- Control Language Programming
- COBOL/RPG Programming

Machine time also available. Call:

**SPEX**

**212-752-8525**

**COMPUTERWORLD TRAINING SECTION**

Examine the issues while Computer Professionals examine your message. Call for all the details

**(800) 343-6474**  
(in MA., 508/879-0700)

The 1990

**COMPUTER TRAINING & SUPPORT**

Conference



The world's computer training & support professionals have gathered this week in Orlando, Florida. Our mission: increased user productivity & learning.

For a free copy of the Conference Report: Call 1-800-34-TRAIN or (315) 354-4092.

**Elliott Masie, Conference Director**

**Sponsors:**  
**(ACTS)**  
Association for  
Computer Training &  
Support

**National Training &  
Computers Project**

**COMPUTERWORLD**

Training Pages  
give you  
cost-effective reach!

That's because Computerworld's training Pages give you the most widespread reach available to management and staff in America's IS departments - the departments that directly control America's IS training dollars.

And for good reason Computerworld is the best read publication in America's IS departments - the departments that directly control nearly 80% of the \$233 billion US market for all ranges of computer software, hardware, data communications equipment, services and staff.

What's more Computerworld's Training Pages lead buyers to your ad with a weekly Training editorial feature that anchors the section and your ad. Whether it's topics like "Unraveling SQL for MIS pros," or "Finishing the training contract," Computerworld's Training Pages deliver pertinent, advice-oriented editorial to Computerworld's readers every week.

**Instructor-Led  
Mainframe Training  
and Development  
for IBM and  
related products.**

**Interact**

INFORMATION SERVICES, INC.

**914-332-6100**

(Within NYS)

**800-628-5471**

(Outside NYS)

See us at booth #108

**WORLD CLASS EXPERTS  
COACH PRICES**

**Live Via Satellite & Videotape**

Bob Holland • Dale Kutnick  
Shaku Atre • John McQuillan  
Jim Herman • Len Kleinrock  
Tim Lister • Dave Crocker

**PLUS Over 60 Leading Industry Experts**

- 20 Hrs of Programming/month
- Live Interaction Via Satellite
- FREE Ku-Band Satellite System
- Course Notes & Workbooks
- Videotape Library
- As low as \$1000/month



The Computer Channel  
1-800-488-4224  
Visit us in Orlando at  
booth #126



**SupportMagic**

Help Desk & Asset Mgmt Software  
CTS Conference - Booth 123  
MAGIC Solutions, Inc • (201) 529-5533

**TEACHER  
IN A BOX**

Comprehensive, Effective, Low-Cost  
Software Training

"Teacher In A Box is great!"  
Penn State University

"The fastest, easiest, most thorough  
and cost efficient way for us to train..."  
Dun & Bradstreet

**Computer Training & Support  
Conference Special!**

Introductory Price + FREE productivity software

Call 800-842-6161  
Teachware, Inc. PO Box 77, Hollidaysburg, PA 16648

**IBM® INSTRUCTOR-LED MAINFRAME TRAINING  
AT YOUR SITE**  
CALL 800-252-8696  
FOR OUR CATALOG OF OVER 80 COURSES

• ASM  
• COBOL  
• CICS VSAM  
• DB2 SQL ORACLE  
• APPLICATION SYSTEM  
• DATA COMMUNICATIONS

**THE KNOWLEDGE EXCHANGE, INC.**

**WE'RE NOT BERLITZ  
BUT WE SPEAK ALL LANGUAGES**

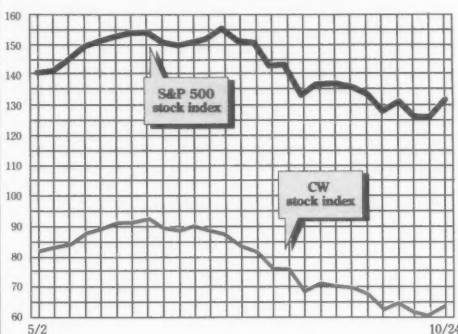
"IBM IS A REGISTERED TRADEMARK OF THE  
INTERNATIONAL BUSINESS MACHINES CORPORATION  
See Us At Booth #320"



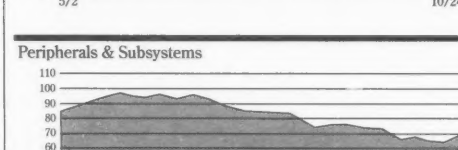
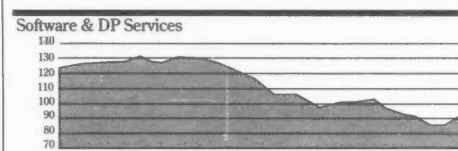
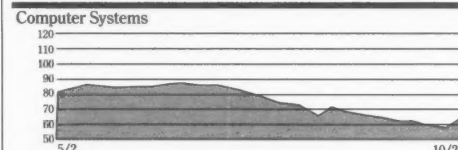
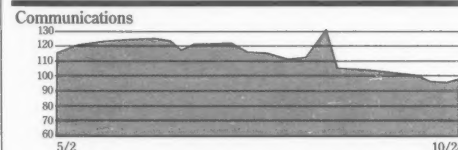




# STOCK TRADING INDEX



Indexes	Last Week	This Week
Communications	95.1	98.8
Computer Systems	59.8	62.9
Software & DP Services	86.6	91.0
Semiconductors	35.5	37.6
Peripherals & Subsystems	65.6	70.8
Leasing Companies	50.4	54.8
Composite Index	60.5	64.2
S&P 500 Index	126.2	132.0



5/2 10/24 CW CHARTS

## Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCT. 24, 1990

52-WEEK RANGE	PRICE CLOSE OCT. 24, 1990	WEEK NET CHG	WEEK PCT CHG
<b>Communications and Network Services</b>			
N AMERICAN INFO TECHS CORP	68 53	65.75	2.3 3.5
N ANDREW CORP	26 16	17.25	0.8 4.5
N ARTEL COMM CORP	10 2	2.125	0.1 6.3
N AT&T	47 30	33.375	2.5 8.1
N AWANTIC INC	5 2	1.75	0.1 3.7
N AYDIN CORP	20 10	10.5	0.0 0.0
N BELL ATLANTIC CORP	57 40	51	1.8 3.6
N BELLSOUTH CORP	59 49	52	0.0 0.0
N COMTEL CORP	16 7	14.5	2.4 19.6
N DATA SWITCH CORP	36 23	34	1.1 3.4
N DIGITAL COMM ASSOC	27 9	9.5	0.3 2.7
N DYNATECH CORP	19 12	14.25	2.0 16.3
N FIBRONICS INTL INC	13 5	8	1.5 23.1
N GANDALF TECHNOLOGIES	6 2	2.375	0.0 0.0
N GENERAL DATACOMM INDS	5 2	2	-0.1 -5.9
N GTE CORP	36 24	28.5	1.1 4.1
N INFOTRON SYS CORP	10 2	1.75	-0.3 -12.5
N ITT CORP	61 40	44.625	3.5 8.5
N M&A COM INC	6 3	4.375	0.3 6.1
N MCI COMMUNICATIONS CORP	48 28	31.125	1.5 5.1
N NETWORK EQUIP TECH INC	34 5	5.875	0.0 0.0
N NETWORK SYS CORP	15 7	6.25	0.5 5.7
N NORTHERN TELECOM LTD	30 21	25.625	2.9 12.6
N NORTELL INC	29 12	24	3.1 15.0
N NYNEX CORP	92 58	70.625	-0.5 -0.7
N PACIFIC TELEVIS GROUP	52 36	44.5	0.5 1.1
N PENRIL CORP	9 5	5.875	1.1 23.7
N SCIENTIFIC ATLANTA INC	29 12	13.625	-1.1 -7.6
N SOUTHWESTERN BELL CORP	65 47	53.5	-0.1 -0.2
N 3COM CORP	19 5	5.75	-0.9 -13.2
N U.S. WEST INC	41 32	37.625	1.6 4.5

### Computer Systems

N ALLIANT COMPUTER SYS	9 1	1.875	0.4 25.0
N ALPHA MICROSYSTEMS	19 10	1.875	0.4 25.0
N ANACOM INC	19 10	11	0.0 15.1
N APPLE COMPUTER INC	48 24	30.5	4.0 15.1
N AST RESH INC	26 9	20	3.5 21.2
N BOLT BERANEK & NEWMAN	8 4	5.125	0.5 10.8
N COMPAQ COMPUTER CORP	68 36	47.5	8.8 22.6
N COMMODORE INTL	12 5	6.375	0.5 8.5
N COMPUTER AUTOMATION INC	6 0	0.813	0.0 0.0
N CONTROL DATA CORP	22 8	9.625	1.6 20.3
N CRAY RESH INC	51 20	24.875	1.4 5.9
N DATA GEN CORP	14 4	9	0.4 8.1
N DATAPoint CORP	5 1	1.375	0.0 0.0
N DELL COMPUTER CORP	14 6	11	1.3 12.8
N DIGITAL EQUIP CORP	95 48	51.75	5.0 10.7
N FLOATING POINT SYS INC	4 0	1.375	0.0 0.0
N HARRIS CORP	38 15	16	0.6 4.1
N HEWLETT PACKARD CO	51 26	29.375	1.6 5.8
N HONEYWELL INC	112 71	83.75	8.0 10.6
N IBM	123 93	108.625	7.9 7.8
N INFORMATION INTL INC	14 9	8.75	-0.3 -2.8
N IPL SYS INC	14 5	9.5	1.3 15.2
N MALBASIC FOUR INC	14 5	1.5	0.3 20.0
N MATSUSHITA ELEC IND LTD	166 116	141	-7.0 -4.7
N MENTOR GRAPHICS CORP	26 9	10	-0.1 -1.2
N NBI INC	1 0	0.172	0.0 22.0
N NOR CORP	72 45	51.25	6.1 13.6
N PYRAMID TECHNOLOGY	36 15	18.5	2.5 15.6
N SEQUENT COMP SYS INC	34 13	16.75	-1.3 -6.9
N SUN MICROSYSTEM INC	37 15	16.75	-2.6 -15.4
N SYMBOLICS INC	2 0	0.25	-0.1 -20.1
N TANDEM COMPUTERS INC	30 10	12	1.1 10.3
N TANDY CORP	44 24	25.125	0.0 0.0
N ULTIMATE CORP	10 3	3	-0.3 -7.7
N UNISYS CORP	18 3	3.5	-0.3 -6.7
N WANG LABS INC	6 3	3.125	0.3 8.7

### Software & DP Services

N AMERICAN MGMT SYS INC	20 11	14.875	0.9 6.3
N AMERICAN SOFTWARE INC	18 8	9.875	1.5 17.9
N ANACOM INC	5 1	6.25	0.0 63.0
N ANALYSTS INTL CORP	24 10	12.5	1.0 8.7
N ASHTON TATE	15 5	7.375	0.5 7.3
N AUTO DATA PROCESSING	60 44	51.125	2.3 4.6
N AUTODESK INC	60 32	41	5.3 14.7
N BMC SOFTWARE INC	30 16	23	3.8 19.5
N BUSINESSLINE INC	12 1	1.625	-0.4 -18.8
N COGNOS INC	10 4	6.75	1.3 22.7
N COMPUTER ASSOC INTL INC	17 4	7.125	1.5 26.7
N COMPUTER HORIZONS CORP	17 8	12.5	0.8 6.4
N COMPUTER SCIENCES CORP	59 37	40.5	2.3 5.9
N COMPUTER TASK GROUP INC	12 8	7.875	-0.3 -3.1
N COMSHARE INC	25 14	17.75	2.3 14.5
N CORPORATE SOFTWARE	16 5	9.5	-1.0 -15.4
N GENERAL MTRS (CLS E)	38 24	34.5	1.8 5.3
N GOAL SYSTEMS INTL	18 10	9.75	0.3 2.6
N HOGAN SYS INC	7 2	2.25	-0.3 -10.0
N INFORMIX CORP	18 4	4.375	-1.0 -18.6
N INTELLICORP INC	8 2	2.125	0.1 6.3
N LEGENT CORP	31 17	19.75	2.5 14.5
N LOTUS DEV CORP	39 13	15.25	0.8 5.2
N MICROSOFT CORP	81 38	65.375	8.9 15.7
N NATIONAL DATA CORP	35 8	9.125	0.4 4.3
N ONLINE SOFTWARE INTL INC	11 4	4.25	-0.4 -8.1
N ORACLE SYS CORP	188 5	16	-0.1 -2.0
N PARSONS SYS INC	19 8	7.875	-0.1 -1.6
N PHOENIX TECHNOLOGIES INC	5 2	1.875	0.0 0.0
N POLICY MGMT SYS CORP	43 30	39	5.0 14.7
N PROGRAMMING & SYS INC	25 11	11.15	-1.6 -12.5
N RELATIONAL TECH INC	10 3	9.125	0.5 5.8
N REYNOLDS & REYNOLDS CO	27 12	13	0.9 7.2
N SAGE SOFTWARE INC	16 8	12	2.4 24.7
N SEI CORP	22 15	16.5	1.3 8.2
N SHARED MED SYS CORP	17 12	15.375	0.0 0.0
N SOFTWARE RUBS CORP	28 14	16	-0.8 -4.5
N STERLING SOFTWARE INC	11 6	7.125	0.4 5.6
N SUNGARD DATA SYS INC	26 11	10.75	-4.3 -28.3
N SYSTEM CENTER INC	25 6	8.375	-2.1 -1.5
N SYS. SOFT INC	29 13	19	2.3 13.4
N WORDSTAR	2 1	0.813	0.0 0.0

### Semiconductors

N ADV MICRO DEVICES INC	11 4	4	0.3 6.7
N ANALOG DEVICES INC	10 6	5.875	0.1 2.2
N ANALOGIC CORP	10 8	8.375	0.1 1.5
N CHIPS & TECHNOLOGIES INC	24 5	2.0	0.0 0.0
N INTEL CORP	52 28	35	3.0 9.4
N MICRON TECHNOLOGY INC	16 7	7.875	0.5 6.8
N MOTOROLA INC	68 51	54.375	4.4 8.7
N NATL SEMICONDUCTOR	9 3	3.75	0.6 20.0
N TEXAS INSTRS INC	44 23	24.875	0.5 2.1
N WESTERN DIGITAL CORP	15 5	6	0.8 14.3

### Peripherals

N ALLOY CORP	2 0	0.625	0.3 66.7
N ARKITE INC	6 1	1.25	0.0 0.0
N AUTO TROL TECH CORP	4 2	2.25	0.3 12.5
N BANCTEC INC	24 12	11.5	-1.8 -13.2
N COGNITRONICS CORP	8 3	5.125	-0.9 -14.8
N CONNER PERIPHERALS	31 11	23.5	6.4 37.2
N DATARAM CORP	22 8	6.25	-0.9 -9.6
N EASTMAN KODAK CO	45 34	39.875	2.8 7.4
N E M C CORP/MASS	7 3	6.75	0.8 12.5
N EMULEX CORP	9 4	4.875	-0.3 -4.9
N EVANS & SUTHERLAND	35 18	18	-0.3 -1.4
N ICN	2 0	0.438	0.1 16.8
N INTERLEAF INC	8 3	3.25	-0.3 -7.1
N IOMEGA CORP	6 3	4.438	0.3 6.0
N MASSTOR SYS CORP	3 1	0.563	0.0 0.0
N MAXTOR CORP	17 4	4.813	-0.3 -6.1
N MICROPOLIS CORP	10 3	8	0.8 14.3
N MINNESOTA MNG & MFG CO	91 71	78.25	3.1 4.2
N PERSONAL COMP PRODUCTS	5 4	3.625	-0.1 -1.7
N PRINTRONIX INC	15 6	8	1.6 25.5
N QMS INC	21 9	13.5	3.4 33.3
N QUANTUM CORP	26 9	18.5	4.0 27.6
N RECOGNITION EQUIP INC	8 4	5	0.0 0.0
N REXION INC	10 4	5.75	1.8 43.8
N SEAGATE TECHNOLOGY	20 11	15	1.4 22.4
N STORAGE TECH CORP	35 11	15	1.5 11.1
N TANDON CORP	4 1	1.875	0.2 11.1
N TEXTRONIX INC	19 12	16.375	0.1 0.8
N TELEVIDEO SYS INC	1 0	0.313	0.1 25.2
N XEROX CORP	63 30	30.625	-0.1 -0.4

### Leasing Companies

N CAPITAL ASSOC INTL INC	5 1	1.063	0.3 41.7
N COMDISCO INC	31 15	16.375	0.1 0.8
N LIT CORP/INSTR	11 11	10.625	0.1 1.2
N PHOENIX AMERN INC	5 3	4.813	0.0 0.0
N SELECTERM INC	7 3	3.5	0.0 0.0

EXCH: N=NEW YORK; A=AMERICAN; Q=NATIONAL

## High-low

### Increased profits do not always lead to higher tech stock prices

You can't please everybody. That maxim was never more tried or true than it was last week when Sun Microsystems, Inc. released its quarterly earnings figures. Despite the fact that the firm quintupled its profits, investors still went away mad — and stomped the stock down 4 3/4 points in the process. By Thursday, Sun closed at 16 1/2, near its 52-week low of 15.

The onslaught of quarterly financials jolted into action what had been a listless market for some tech stocks, a crash course in bottoming out for others. The one-two punch of new midrange machines last week and positive earnings reports the week before made heavyweight Digital Equipment Corp. a winner. DEC picked up 3 3/4 points to close Thursday at 53. Opponent IBM waffled during the week, finally gaining 1/2 of a point to close at 108 1/2.

Unisys Corp. dealt Wall Street a heavy blow in the form of yet another quarterly loss. Although its income improved, Unisys did not fulfill its earlier prediction of a profitable third quarter. This, coupled with the resignation of chairman Michael Blumenthal, pushed Unisys stock down 3/4 of a point to a new low of 3 3/4.

Motorola, Inc. evidently bewitched investors with its wireless radio technology as it shot up 2 1/2 points to 53 1/2 (see story page 12). Intel Corp. slipped 5/8 points to 34 1/2, while Advanced Micro Devices, Inc. inched up 1/8 of a point to 4 1/2.

Elsewhere, Computer Associates International, Inc. posted a threefold profit increase, kicking its share price up a point to 6 1/2. Microsoft Corp. added 2 3/4 points to 64 1/2, and Lotus Development Corp. gained 1/2 of a point to close at 15 1/2.

MCI Communications Corp. soared 2 1/4 points to 30 1/2, recovering exactly those points lost after its disappointing financial news the week before last.

KIM S. NASH

## PACs

FROM PAGE 1

Matsui, Norman Y. Mineta (D-Calif.) and Sen. Max Baucus (D-Mont.), as well as key committee chairmen.

Matsui's corporate benefactors came from all segments of the industry, including Motorola, Inc., Electronic Data Systems Corp. and Hewlett-Packard Co. "He's the kind of Democrat we like to see on the [House] Ways and Means Committee," said Mary Dee Beall, PAC manager at HP in Palo Alto, Calif.

Among the top recipients of computer PAC funds is Rep. John Conyers Jr. (D-Mich.), who oversees federal computer procurement policies as head of the House Government Operations Committee.

In the Senate, another political force is at work. There, several industry PACs are backing Republicans in hopes of switching that chamber to GOP control someday soon. The business community generally feels that a Republican-controlled Senate could put the brakes on any anti-business legislation coming out of the Democratic-controlled House of Representatives.

Consequently, computer industry PACs are backing all of the Republican incumbents in the Senate as well as GOP challengers Claudine Schneider in Rhode Island and Lynn Martin in Illinois.

"We feel that legislation gets a better hearing when it has to go through a two-party system," Beall said.

The top recipient is Sen. John Warner (R-Va.), who received \$20,375 from computer industry PACs — although he had no significant opposition this elec-

tion. Lobbyists explained that Warner is the top Republican on the Senate Armed Services Committee, very accessible and the "local senator" for the industry's government relations offices in northern Virginia.

Other highlights of the study include the following:

- The biggest PAC in the computer business is run by Dun & Bradstreet Corp., which has one foot in the software industry and the other in the information services industry.

- Many of the industry's smaller PACs, such as those run by Microsoft Corp., Storage Technology Corp. and Tektronix, Inc., focused their contributions on the congressional delegation of their home state.

- PACs sponsored by Dun & Bradstreet, Motorola and Xerox Corp. have a historical pattern of favoring Republicans.

- An up-and-comer is Rep. Tom Campbell (R-Calif.), a freshman representing the district once held by Ed Zschau, who was immensely popular with high-tech industries and backed Campbell as his heir apparent. Campbell has already become a key GOP strategist on high-tech policy and received \$7,150 in computer PAC money.

Overall, the computer industry's 21 PACs contributed nearly \$611,000 directly to federal candidates from the start of the election cycle in January 1989 through September this year. That puts the industry on a par with car dealers but well below the million-dollar PACs run by the American Medical Association and the National Association of Realtors.

The computer industry's PAC totals are not any larger be-

cause several of the industry's biggest companies do not have PACs, including IBM, Digital Equipment Corp., Apple Computer, Inc., Computer Associates International, Inc. and the Computer and Business Equipment Manufacturers Association (CBEMA).

CBEMA's members "have just not thought it is worth the effort it takes to put one together, solicit the money and manage it," said Ted Heydinger, vice-

president of government relations at CBEMA.

Others, such as the American Electronics Association and the Information Industry Association (IIA), had PACs in the mid-1980s but eliminated them. "Given the amount of administrative hassle required to fill out the paperwork, we got rid of it," explained Kenneth B. Allen, senior vice-president for government relations at the IIA.

## Narrow field

Industry PACs are deluged with requests for money, so the PACs typically narrow the field of candidates by selecting those with favorable positions on industry issues, key leadership posts and constituents who are company employees, PAC managers said. Also, PACs tend to give larger amounts to candidates in a tough race, where the money might make a difference.

At HP, there is one more test for ethics and statesmanship, Beall said. PAC funds are denied if "we think he's been a sleazeball or an extremist," she said.

Michael C. Maibach, director of government affairs at Intel Corp., said the biggest determining factor for his semiconductor company is whether the candidate supports a "vigorous trade policy rather than a hands-off trade policy."

Most of the candidates heavily favored by the computer industry are incumbents expected to win re-election easily. The exceptions include GOP challengers Schneider and Martin, who are opposing Sens. Claiborne Pell (D-R.I.) and Paul Simon (D-Ill.), respectively. Industry lobbyists said they favor Schneider and Martin because they are more responsive to business.

However, PAC managers recognize that there are risks in backing a candidate who may be on the losing side. "We like to look for challenge situations which won't kill us one way or the other if we choose the wrong one," Beall said.

The high-tech industry went all out in support of Ed Zschau for the Senate in 1986, she noted, but Zschau lost narrowly to incumbent Sen. Alan Cranston (D-Calif.). Fortunately, "Cranston has continued to be very accessible to us," Beall said.



## Even Steven

Unlike the other computer PACs, the Computer Dealers and Lessors Association (CDLA) distributes the bulk of its PAC funds to the Republican and Democratic campaign committees, rather than doling out the funds directly to individual candidates.

"We have an ethical problem with giving to candidates who might help us down the road — so-called renting votes," explained William H. Sells, CDLA's director of government relations.

CDLA instructs the party campaign committees to distribute the money evenly to incumbents and challengers, Sells added, in order to give challengers a chance at unseating incumbents.

"If incumbents get all the money, they just keep getting elected over and over again. Some may deserve it... but the budget mess shows that incumbents are a little bit gun-shy about making the tough decisions. They keep getting elected, and they probably shouldn't be," he said.

MITCH BETTS

## Top 5 recipients in the Senate and House

The top recipients of computer industry PAC contributions include pro-business candidates, particularly Republicans, and longtime friends in the House races

U.S. Senate		Total computer industry PAC contributions Jan. 1989 - Sept. 1990 (with top donors)
1 Sen. John Warner (R-Va.) Defense powerhouse; top Republican on the Senate Armed Services Committee. No Democratic opponent		\$20,375 (D&B, Unisys)
2 Sen. J. Bennett Johnston (D-La.) Pro-business moderate; active member of Senate Appropriations Committee. Re-elected Oct. 6 in an open primary		\$16,414 (CDLA, D&B)
3 Rep. Hank Brown (R-Colo.) Conservative GOP candidate for open Senate seat. Favored to win		\$14,266 (D&B, Motorola)
4 Sen. Rudy Boschwitz (R-Minn.) Moderate Republican and champion fundraiser. Safe seat		\$13,873 (D&B, EDS)
5 Rep. Claudine Schneider (R-R.I.) Friendly with high-tech industries; co-chairs the Congressional Competitiveness Caucus. Liberal Republican in uphill Senate race against Sen. Claiborne Pell (D-R.I.)		\$12,516 (D&B, Motorola)

## U.S. House of Representatives

1 Rep. Robert T. Matsui (D-Calif.) Champion of high-tech industry's tax and trade policies; chairs the House Ways & Means Committee's Subcommittee on Trade. Safe seat	\$9,150 (Motorola, EDS)
2 Rep. Tom Campbell (R-Calif.) Freshman, becoming a key GOP strategist on technology policy. Safe seat	\$7,150 (Intel, Motorola)
3 Rep. Les AuCoin (D-Ore.) Long-time friend of the semiconductor industry; district includes Mentor Graphics Corp., Intel and Tektronix facilities. Safe seat	\$7,000 (TI, Intel)
4 Rep. John Conyers Jr. (D-Mich.) Chairman of the House Government Operations Committee, in charge of federal procurement. Safe seat	\$6,200 (CSC)
5 (tie) Rep. Les Aspin (D-Wis.) Defense powerhouse; chairman of the House Armed Services Committee. Safe seat	\$6,000 (TI, Unisys)
5 (tie) Rep. Charles Wilson (D-Texas) Supported by Texas-based corporations. Safe seat	\$6,000 (TI, EDS)

CDLA: Computer Dealers and Lessors Association  
CSC: Computer Sciences Corp.  
EDS: Electronic Data Systems Corp.

Sources: Federal Election Commission; Congressional Quarterly, Inc.

CW Chart: Tom Monahan

## PAC it in

For the telecommunications industry, the hottest campaign by far is in low-tech Iowa, where the very close U.S. Senate race pits Republican Rep. Thomas J. Tauke against Democratic incumbent Sen. Tom Harkin. Tauke is the darling of the seven regional Bell holding companies for promoting legislation to lift the court-ordered restrictions on their business activities.

The result: Tauke has received a whopping \$75,000 from telecommunications political action committees, mostly from regional Bell companies such as Nynex Corp., Pacific Telesis Group and Southwestern Bell Corp.

Not surprisingly, Harkin is backed by industry opponents of Tauke's bill; notably MCI Communications Corp., AT&T and the North American Telecommunications Association (NATA).

The telecommunications industry, still heavily influenced by Washington policymakers, is naturally more active in political campaigns than is the computer industry. Overall, 19 telecommunications industry PACs gave nearly \$2.8 million to federal candidates through last month.

AT&T's PAC — the biggest corporate PAC in the U.S. — accounted for nearly \$1.3 million of that total, and the regional Bell holding companies together accounted for approximately \$796,000.

MITCH BETTS

# Tech execs hit campaign trail

BY JAMES DALY  
CW STAFF

Computer company executives Dennis Thompson of California and Len Umina of Massachusetts have temporarily departed the corporate office to take on the political establishment. Both are long-shot, independent party candidates for the office of governor of their states in next week's elections.

For the past few months, both men have wrapped themselves in the flag instead of in mundane business concerns and have given the political trail a technological twist as they seek victory in next week's elections.

"I've been a programmer for 30 years, and if there's one thing writing millions of lines of code teaches you, it's that you have to be honest or you're going to get nailed in the end," said Thompson, who is president of Epicom, Inc., a software development house in San Diego.

Although they are a continent apart, Thompson and Umina, who develops new technologies at Digital Equipment Corp. in Maynard, Mass., share several personal and ideological traits.

Both hail from states closely linked with high technology, neither has held a political office, and both feel that the white line down the center of the road is about as much governmental interference as they can take. Most political analysts say that realistically, they have about as much chance of becoming governor as a ham sandwich does.

Instead, in Thompson's own words, they view themselves as "spreaders of ideas."

The central tenet of both campaigns is that state government is a field of incompetence

that has grown weedlike and needs to be hacked back.

"We've had enough of the patronage, we've had enough of the consultants, we've had enough of the corruption and mismanagement," said Umina, who leads the Independent High-Tech party ticket. "We don't want services cut — we want government cut."

Umina, 38, has proposed an ambitious watchdog approach to state government in which the Information Age wraps its arms snugly around the machinery of state politics.

His central plan calls for an elaborate technological hookup called Public Access Computerization in which government agencies are compelled to provide weekly updates of their

goals and budgets.

The Public Access Computerization information would reside in a central mainframe repository in Boston that could be accessed via modem from either a home personal computer or a network of terminals at local public libraries. "Citizens get apathetic because they don't know what's going on," Umina said.

Umina said he does not expect every citizen to spend hours sifting through the reams of data such a system would generate, but the scores of localized investigations would cover enough ground to keep the service worthwhile and the politicians honest. Additionally, each voter would be mailed a yearly update on the state government — on an optical disc.

Although Umina is a long shot, some of his messages appear to have struck a chord with state voters. *The Boston Globe*

has already reported that Umina and running-mate Lawrence DeBerry are supported by 5% of the eligible voters.

Thompson's political agenda, on the other hand, bears little technological coloration but instead attacks what he considers to be the cause of America's slipping high-tech leadership: high business taxes.

The "star that would guide my ship of state," he said, would be the elimination of all business taxes.

"In truth, businesses don't pay these taxes — consumers do, through increased price," said Thompson, 51, who is the gubernatorial candidate for the state's 50,000-member Libertarian party.

Thompson said the elimination of these taxes would make the state's industrial goods and services much more desirable throughout the country and the world.



Thompson sees himself as a 'spread-er of ideas'



Umina feels that citizens don't know what's going on

## Adaptive prepares 45M-bit platform

BY ELISABETH HORWITT  
CW STAFF

REDWOOD, Calif. — Founded a year ago to develop the next generation of switches for parent company Network Equipment Technologies, Inc. (NET), Adaptive is expected to justify its existence this week by announcing a high-end platform for 45M bit/sec. networking.

Adaptive Chief Executive Of-

ficer Audrey MacLean confirmed that the firm will introduce "broadband products for both the corporate user and carrier" that will support multiple 45M bit/sec. T3 links and provide the basis for future support of network industry standards such as broadband Integrated Services Digital Network and Synchronous Optical Network.

The products will also eventually support both switched

multimegabit data service and frame relay.

NET and Adaptive are also expected to announce their intent to provide a network management system that would use Open Systems Interconnect's Common Management Information Protocol to manage NET switches and Simple Network Management Protocol to manage local-area network interconnectivity devices, a spokeswoman said.

Sears Technology Services, Inc. has "been working with Adaptive to take advantage of their first product in the T3 multiplexing environment," said Gary Weis, a senior vice-president at the Sears, Roebuck and Co. subsidiary. "They have shared their technology direction with us, and we feel comfortable with it," Weis added.

Support of the carrier industry's standards will be a crucial attribute for the new switch, according to Richard Malone, a principal at Dedham, Mass.-based research firm Vertical Systems Group. "This switch should go into anybody's network," in contrast to NET's existing IDNX line, Malone said.

The Adaptive switch may be justifiable only for carriers or end-user companies such as Sears, said Frank Dzubeck, president of Communications Network Architects, Inc.

End-user market demand for T3 switches is projected to reach \$20 million this year, climb to \$45.1 million next year and reach \$203.9 million in 1994, according to a report recently published by Vertical Systems.

## Microsoft plans interface between Windows and OS/2

BY MARK HAMILTON  
IDG NEWS SERVICE  
and JAMES DALY  
CW STAFF

Microsoft Corp. officials ended months of speculation recently by indicating that they are developing methods to allow the popular Windows graphical user interface environment to run under the still-struggling OS/2 and that they have no plans to merge DOS and Windows.

Microsoft intends to provide libraries that will act as interface layers between Windows applications and OS/2, said Steve Ballmer, senior vice-president in charge of systems software.

The firm has already moved in this direction with its Software Migration Kit and the Binary Compatibility Layer, which is slated for inclusion in a later release of OS/2.

President William Gates also indicated that Microsoft developers will add support for Windows programming interfaces to a portable implementation of OS/2 under development. This would allow users to run Windows applications directly from OS/2 without performance loss.

Ballmer said DOS and Windows will not be merged nor will the firm force its OEM customers to take both products and offer them as a standard bundle.

Analysts said users continued to remain cool toward the newer operating system. As a result, Ballmer said that users should only adopt OS/2 immediately if

they need to run mission-critical applications requiring the additional features provided by OS/2 that are not in DOS.

"OS/2 will not replace DOS in the foreseeable future," Ballmer said. Meanwhile, Windows 3.0 continues to be a hit among the installed base of DOS users.

### Loyalty to DOS

Gates recently said that the Redmond, Wash.-based firm does not intend to pull back support for Windows-DOS users. "In terms of volume, Windows has won [the battle for the desktop], and it's important for us to enhance that," Gates said. "In terms of the mainstream, Windows is it."

According to Ballmer, upcoming versions of Windows will lean toward object-oriented features that make them powerful, yet easy to use. This would go further than Hewlett-Packard Co.'s New Wave, he said.

A future version of Windows, expected by mid-1991, will also support True Type font scaling and offer more networking capabilities, Ballmer added. "We are putting in hooks to allow more devices to be used: multimedia systems, handwriting input — all of those things are important."

Microsoft is also reportedly considering adding task switching capabilities to DOS 5.0, which is expected to be released in January.

Hamilton is on the staff of PC Business World in London.

## Kodak gives sneak peek at high-resolution technology

BY RICHARD PASTORE  
CW STAFF

NEW YORK — Eastman Kodak Co. preannounced compact disc/read-only memory (CD-ROM)-based technology last week designed to make it possible for desktop computer users to manipulate, edit and print full-color images with resolution four times that of high-definition television by 1992.

Furthermore, Kodak promised that the prices for the system and service will be kept down to mass-consumer levels.

"Businesses will be able to pull up and edit color images at a digital level — something not possible before at this level of detail and price," said Bill Perry, director of research at Helgerson Associates in Falls Church, Va.

The Kodak technology transforms a 35mm color image into 18M bytes of data and places it

on a special Photo CD. Played on an industry standard CD-ROM XA or CD-I player, the images can be displayed on MS-DOS, OS/2, Unix and Apple Computer, Inc. Macintosh platforms.

Utilities and hardware announced last week allow users to incorporate the CD images into other applications packages. The images can also be printed with resolution intact with a Kodak thermal printer.

At the same time, Kodak proposed a standard for the consistent depiction of high-resolution color across computer, print and broadcast media. "There are a whole set of various standards in terms of how people characterize color," said John White, vice-president and general manager at Kodak's Integration and Systems Products Division.

"If anyone can establish a standard, Kodak can," Perry added.



## NEWS SHORTS

### NREN legislation advances

The U.S. Senate approved a bill last week accelerating research on high-performance computers and creating a National Research and Education Network [CW, Oct. 8] that would link the nation's science centers with a high-speed data network for collaborative work. The U.S. House of Representatives has not passed the authorizing bill, but Sen. Albert Gore Jr. (D-Tenn.) successfully lobbied for \$35 million in appropriations so work can begin anyway. The funds were added to the budgets of the Defense Advanced Research Projects Agency and the National Aeronautics and Space Administration.

### Parallan ships multiprocessor

Parallan Computer, Inc. in Mountain View, Calif., said last week that it is shipping a line of multiprocessing servers that offers the same data integrity and error-correcting memory capabilities found on minicomputers. Called Server 290, the product runs OS/2 LAN Manager, DOS and Windows applications. Parallan enters a fray in which vendors are trying to give networks the reliability of minicomputers and mainframes. Already in the fight are Compaq Computer Corp. and Netframe Systems, Inc.

### Entry-level Framework delivered

Ashton-Tate Corp. has begun shipping Framework XE, a package of seven commonly used business software applications. The entry-level version of the company's Framework III package offers word processing, spreadsheet, data management, graphics, outlining, communications and electronic mail functions and is available at a suggested retail price of \$149.

### Shift in Dow's IS group

A recent management shakeup at Dow Chemical U.S.A. has changed the highest-level information systems executive. Donald S. Pirkle was named to replace Ralph W. Boeker as vice-president of IS in the executive department and also became a member of the management committee. Pirkle, whose background is in engineering and sales, is responsible for long-range IS strategy and planning. Hans Huppertz, director of corporate IS, continues to be in charge of the daily IS function and its staff. Boeker was named group vice-president of Dow U.S.A.'s Chemicals and Performance Products Division.

### HDS disk users cite delays

Hitachi Data Systems, Inc. began shipping its 7390 high-capacity disk drive last week, but users are already complaining about the availability of the older 7380 K disk drives. The company confirmed that the transition to the new drives has created a three-month backlog for orders.

### Conner offers new disks

Conner Peripherals, Inc. last week introduced several hard disk drives designed for the high-end, compact laptop and notebook computer market (see stories pages 1 and 131). Developed in cooperation with Compaq, the 2½-in. drives range in capacity up to 64M bytes. A family of 3½-in. drives with capacities of up to 510M bytes was developed with Olivetti PLC Ltd. and is designed for servers, workstations and multiuser systems.

### Advances in C++

Hewlett-Packard Co. and AT&T's Unix System Laboratories have implemented new features in their respective versions of the C++ programming language. AT&T has adopted technology from Object Design, Inc. in Burlington, Mass., which includes Release 3.0 of AT&T's C++ "parameterized types" or templates. This allows programmers to build libraries of structures without having to know about the objects manipulated by the structures, the company said. HP now has a C++ compiler for its HP-UX system that generates native code for the HP 9000 computer. Also, C++ Developer, a class construction and browsing tool, is now available for the HP Domain/OS system.

## IBM, DEC to unwrap Unix treats

BY MARYFRAN JOHNSON  
CW STAFF

NEW YORK — IBM and Digital Equipment Corp. will play the Dynamic Duo on Halloween this week as they introduce new Unix-based systems to flesh out their reduced instruction set computing (RISC) product lines.

At the Unix Expo trade show, IBM is expected to unveil a high-end RISC System/6000 Power-server offering 25% more power than the current top of that line. Industry observers said they believe the machine will pack 55 million instructions per second (MIPS) in power and show an IBM dedication to the Unix workstation market.

"In a market that changes as rapidly as the Unix workstation market does, you have to revisit your strategy frequently," said Peter Burris, an analyst at Inter-

national Data Corp. in Framingham, Mass. "IBM needs to show that it is capable of seeing where the holes in its product line are and responding to that quickly."

### Soup to nuts

DEC will be introducing two new machines — the Decsystem 5100 and Decsystem 5500 — which give it a new entry-level RISC box on one end and its fastest uniprocessor Decsystem on the other.

The Decsystem 5100, at 19 MIPS, is priced from \$10,995 and comes with 8M bytes of memory and 209M bytes of disk storage, according to Terry Shannon, an IDC analyst.

The high-end Decsystem 5500, at 28 MIPS, starts at \$41,900 for a system with 32M bytes of memory but no disk storage. It will also be offered for \$63,000 with a 665M-byte disk,

compact disc/read-only memory reader and digital audio tape drive, Shannon said. "This will certainly lend credibility to DEC's contention that it's in the market to stay," Shannon said.

The company will also be dropping prices by roughly \$2,000 on both the Decstation 2100 and 3100, to \$4,995 and \$6,995 respectively.

One user who has been anxiously awaiting the debut of the Decsystem 5500 is Gerald Siddons, director of scientific computing at the Dana-Farber Cancer Institute in Boston.

"We've got our purchase order in. It's a hot machine, and we're drowning in information," Siddons said last week. He plans to put three of the new systems on his Unix-based network, which once relied on a VAX 8500 to support hundreds of users.

## Compaq

FROM PAGE 1

Both systems run at 20 MHz and support IBM VGA-compatible resolution. At a starting price of \$5,499, the TI is priced \$1,000 lower than the Compaq notebook. The TI falls short in storage, however, offering 20M- and 40M-byte hard drives as opposed to the 30M- and 60M-byte drives Compaq offers.

Storage issues may slow the entire market for 386SX-based notebooks.

Conner Peripherals, Inc., which provides hard drives to a number of computer vendors, including Compaq, has announced that its 40M-byte 2½-in. hard drives will not be available until January. Analysts said that problem has delayed 386SX-based notebook announcements from such vendors as Toshiba America Information Systems, Inc. and has slowed already announced vendors, such as Epson America, Inc.

There have been reports in the industry that Conner is having difficulty making its 60M-byte drives in volume, although Conner said it is meeting its scheduled shipments to Compaq, and the 60M-byte drives should be available in volume in the first quarter of 1991.

"If Compaq can't ship its 60-meg machine, there could be a tremendous window for competitors," said David Korus, a personal computer analyst at Kidder, Peabody & Co. Korus said he thinks the fourth quarter could be a long one for vendors of 386SX-based notebooks while they wait for Conner to produce drives. "I think you have to ask, 'Will people want an SX with a 20-meg hard drive?'" he said. "Also, who's going to buy a 30-

meg machine in [Compaq's] price range?"

Korus said Compaq has seriously overpriced its 386SX-based notebook and added that a number of vendors will introduce similar machines before the end of the year with prices ranging from \$2,500 to \$3,000.

For instance, Austin Comput-

er Systems recently introduced a 6-pound, 20-MHz 386SX-based notebook with a 10-in. diagonal VGA-compatible screen and 3½-in., 1.44M-byte floppy drive for \$2,690.

Analysts said they expect that the 386SX market will see a number of vendors new to the laptop arena, much as TI is.

## Is it smaller than a laptop? Yes, at Tokyo Data Show

BY LORI VALIGRA  
IDG NEWS SERVICE

TOKYO — Tiny portable computers caught the spotlight at the annual Data Show, a major Japanese computer show held last week.

Laptops, book-size and hand-held portables proliferated at the show. Fujitsu Ltd. and NEC Corp. both displayed their recently announced slim-profile laptops, made smaller and lighter by power-saving circuits and plug-in memory cards instead of floppy disks.

Fujitsu's FMR-50NB1, which is about half the size of a briefcase, measures 1 in. high, 11½ in. wide and 8 in. deep and weighs in at 2.2 pounds. Though lighter than NEC's PC-98 HA (2.4 pounds), the Fujitsu model possesses a full-size keyboard, while NEC's has a Chiclet-style board reminiscent of IBM's old Peanut small computer, industry analysts said.

Fujitsu's model is higher priced at \$1,831, while NEC's sells for \$1,523. Both use plug-in memory cards instead of floppy disks to keep the compact footprint. They are comparatively expensive, according to Fujitsu,

which said one card could cost about \$76.90 to produce.

The power-saving Fujitsu model uses technology developed by U.S.-based Poqet Computer Corp., in which Fujitsu has a 58% investment. Both NEC's and Fujitsu's models use LCDs.

According to estimates by the Japan Electronic Industry Development Association, shipments of book-size and laptop computers exceeded desktop shipments for the first time in the first quarter of this year, with 327,000 of the small computers shipped, representing 51% of a total of 644,000 personal computers.

Portable laptops are expected to see strong growth during the next three years, according to the association, with shipments increasing from 1.5 million units in 1991 to 2.4 million units in 1993.

The show held other attractions, such as multimedia systems from IBM Japan Ltd. and NEC using Intel's DVI multimedia standard. The show is sponsored by the Japan Electronic Industry Development Association and the Communication Industry Association of Japan.

Lori Valigra is the Tokyo bureau chief for IDG News Service.



# DEC opens door, lets Unix in

BY MARYFRAN JOHNSON  
CW STAFF

MAYNARD, Mass. — Like an old tiger resigned to changing its stripes, Digital Equipment Corp. last week declared its intention of prying open the proprietary VAX/VMS operating system and allowing Unix into the lair.

Amidst a flurry of product announcements (see story at right), the company also revealed the bare bones of a plan to re-engineer VAX/VMS onto a reduced instruction set computing (RISC) CPU, a transition similar to Hewlett-Packard Co.'s development of its RISC-based Precision Architecture.

The only detail that company officials were willing to provide about the shift to a high-speed RISC CPU was that all VMS applications will run on the new systems without major code re-writing.

Yet behind the marketing razzle-dazzle about freewheeling applications portability on multi-vendor networks, there lurks a long wait for users who are hankering to run Unix applications under VMS without serious performance problems.

"A key issue is having sufficient performance on your system to make it practical to use a VMS system to run Unix," said Kevin Oberman, a network manager at Lawrence Livermore Laboratories in Livermore, Calif.

Oberman, who manages Unix and VMS environments at his lab, said the VMS system kernel will require substantial tinkering

before it can handle certain functions Unix does well. How DEC plans to run Unix applications under VMS is still unclear, but company officials said they will not employ the IBM method of running a "guest" operating system under the host.

DEC officials also acknowledged that they are taking only the first steps in what will be a three- to five-year journey. The road is littered with so-called industry standards still in dispute.

"It's a wait-and-see game on

Version 5.4, which will support three Posix standards under development by the Institute of Electrical and Electronics Engineers. These standards include an application interface, a shell utility and real-time processing for Unix applications.

DEC is also applying for "branding," or certification, of VMS by X/Open Consortium Ltd., a standards consortium of which DEC was the first mem-

**digital**

## Power up

DEC's Model 500 lineup doubles the performance of the VAX 6000 family

VAX 6000 model	Performance improvement over VAX-11/780	Server base system price*	Base system price*	Preconfigured system price**
510	13	\$156,000	\$227,000	\$388,000
520	up to 25	\$279,000	\$393,000	\$654,000
530	up to 37	N/A	\$523,000	\$930,000
540	up to 49	N/A	\$649,000	\$1,205,000
550	up to 61	N/A	\$742,000	\$1,290,000
560	up to 72	N/A	\$811,000	\$1,470,000

\*Prices shown are for VMS systems with one-year product warranty (standard warranty recommended)  
\*\*Preconfigured systems include memory, disks and other features

Source: Digital Equipment Corp.

CW Chart: Paul Mock

where these Unix standards are going to fall out," said Gordon Brazas, director of telecommunications and computer facility planning at Kellogg Co. in Battle Creek, Mich. "We're doing what a lot of people are doing — sitting back and saying they're tired of waiting for two years for the promises to develop."

By mid-1991, customers should see the first tangible signs of DEC's shift toward an open VMS in an enhancement to VMS

ber. The company said it will make VMS comply with XPG3, X/Open's latest set of applications portability standards.

How much portability Posix compliance will provide is still in question, however.

"Posix and X/Open is a 40% solution," said Mark Scherfing, supervisor of Unix and communications support at GTE Laboratories in Waltham, Mass. "A lot of the software we use goes beyond Posix, and there's just so

much you can do before you have to get into the internals of the system. But I do think DEC has gone a long way toward a common foundation for the Unixes."

Peter Schay, an analyst at Gartner Group, Inc. in Stamford, Conn., said DEC's strategy will particularly appeal to VMS users who need to run one or more Unix applications and those companies eyeing open systems as a long-term direction.

DEC officials stressed that there are no plans to blend VMS

and Ultrix, DEC's own Unix version. Last week, the company committed to blending Ultrix with the Open Software Foundation's OSF/1 version of Unix (see story below).

While DEC is trumpeting its progress toward becoming the first proprietary operating system to support the Posix standard, many users noted that by the time those standards become reality, IBM and other major vendors will be supporting them as well.

## VAX attack

Digital Equipment Corp. rolled out a slew of new products last week alongside a rough sketch of its future VAX/VMS architecture. Among the hardware highlights are the following:

- DEC introduced the VAX 6000 Model 500, which offers at least 85% more performance for a 16% to 18% increase in price compared with the Model 400.

DEC also cut prices by an average of 27% on the VAX 6000 Models 310 and 410. Yet, the base system prices on the new models can be somewhat misleading, analysts noted. The VAX 6000 Model 510, for example, has a base price of \$227,000 but includes no disk, memory or I/O channel. The "preconfigured" Model 510 at \$388,000 is "closer to the real-world configuration," said Terry Shannon, an analyst at International Data Corp. in Framingham, Mass.

The Model 500s also require new memory based on 4M-bit dynamic random-access memory technology. Memory is available at \$34,650 for the 32M-byte module, \$67,200 for the 64M-byte module and \$115,500 for the 128M-byte module. All systems and memory are available now.

- Two new Microvaxes joined the bottom of that line as the lowest priced multiuser VAXs. The Microvax 3100 Models 10E and 20E, starting at \$8,000, are 45% more powerful than current 3100s for the same price and are available now.

- The Vaxstation 3100 Model 76 workstation tops off DEC's proprietary workstation line with a 100% performance boost over the previous models and is priced at \$11,950 to \$27,840. It is scheduled for availability Nov. 15.

## OSF/1 unveiling gets mixed reviews

BY JOHANNA AMBROSIO  
CW STAFF

NEW YORK — The Open Software Foundation last week announced — to decidedly mixed reviews — that its OSF/1 Unix-like operating system will be available for purchase by vendors beginning next month.

With a couple of exceptions in the areas of multiprocessing and parallel processing, OSF/1 does not appear to have any signifi-

cant technical advantages over AT&T's Unix System V, critics charged. Because System V, Release 4 is already entrenched, and it will probably take at least a year for OSF/1 to show up in users' hands, it is unlikely that OSF members will prevail in the Unix market, according to industry observers.

All three major OSF backers — IBM, Digital Equipment Corp. and Hewlett-Packard Co. — said they will blend OSF/1

into their existing versions of Unix. DEC said it will make an OSF/1 developer's tool kit available during the first quarter of next year.

DEC will ship a version combining OSF/1 and its Ultrix operating system during 1991, and IBM will similarly incorporate OSF/1 into its AIX product line. However, executives from both companies refused to say how much the resulting products would resemble their existing

systems and how much would actually be taken from OSF/1.

Of the three, only HP committed to using a more-or-less unadulterated version of OSF/1, which will be on a reduced instruction set computing workstation to ship next year.

The Open Software Foundation, however, said that OSF/1 was written for the computing models of the future and that it will require some time to catch on. "It's a new technology, and it takes a while for this sort of thing to find its way into products," said OSF President David Tory.

Users said they are not overly concerned about the Unix wars, especially because executives from both major camps have said their products will remain compatible with international standards, most notably the X/Open Portability Guide. This will ensure some degree of compatibility among most of the different Unix versions, observers said.

"From a practical perspective, there are no real differences among the different types of Unix," said Michael Prince, director of information services at

the Burlington Coat Factory in Lebanon, N.H. "Sure, there are some inconveniences for porting, but I find the differences mostly irrelevant to anything except systems administration."

Timothy Cutler, director of information systems at Kodak Park in Rochester, N.Y., which is Eastman Kodak Co.'s largest manufacturing facility, said he is not too worried, either: "My expectation is that both System V and OSF/1 will comply with industry specifications and will incorporate standard remote procedure calls and user interfaces. As long as they do that, the operating system itself is not an issue."

Thus, it seems for now to be mostly a vendor-driven tug-of-war between the two major Unix variants. However, some observers questioned vendors' commitment to incorporating OSF/1 into their products. "The backers' comments were kind of squishy," said Maureen O'Gara, publisher of "Unigram X," a weekly Unix newsletter in Garden City, N.Y. "They didn't say anything too specific."

Second-class postage paid at Framingham, Mass., and additional mailing offices.

Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Copyright 1988 by CW Publishing/Inc. All rights reserved.

Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed: back issues, if available, may be purchased at \$2.00 per issue, plus postage. Call (800) 669-1002.

Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$5.00 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970, 508-744-3350.

Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. For Back issues contact Margaret McIndoe.

Requests for missing issues will be honored only if received within 60 days of issue date. Subscription rates: \$2.00 a copy: U.S. — \$48 a year; Canada — \$110 a year; Central & So. America — \$130 (surface), \$250.00 (airmail) a year; Europe — \$195 a year; all other countries — \$295 a year. Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Subscriptions call toll free (800) 669-1002.

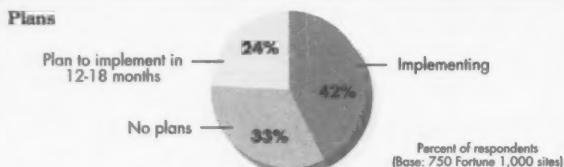


POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, P.O. Box 2044, Marion, OH 43035.

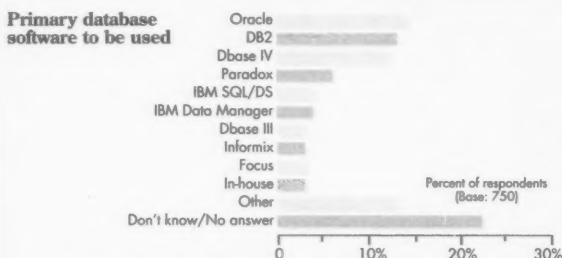
## TRENDS

## CLIENT/SERVER COMPUTING

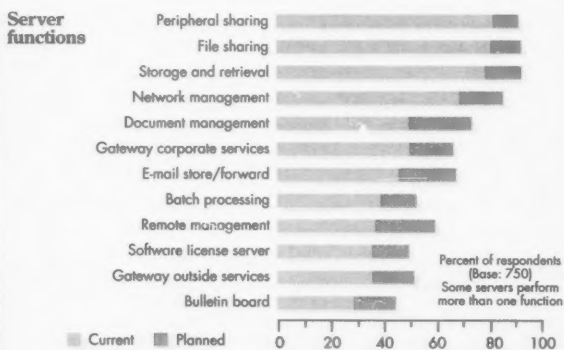
Appetites have been whetted by the promised flexibility and power of client/server technology, and users know what they want but are still treading lightly



A majority of respondents agree that client/server computing is an enabling technology and that the time to implement is now, but one-third have no plans for the near future



Being chosen as the primary database in client/server applications is a feather in the cap, but the majority of end users are still undecided about where to toss their votes



Server use, both current and planned, runs the gamut, with peripheral and file sharing and data storage being cited as primary tasks

Source: Business Research Group, Newton, Mass.

CW Chart: Doreen St. John

## NEXT WEEK

Networks and compa-nywide databases keep the legal eagles of Jones, Day, Reavis & Pogue flying together even as they spread their wings out to soar from their Cleveland-based company throughout the U.S., Europe and the Far East. See how **Bill Steinbrink** helped the law firm accomplish this in *Manager's Journal*.



Bruce Zale

It's new. It's hot. It saves money, time and space. It can even change the way that people work. But what is imaging, really? It's a complicated mixture of technologies that can mean either big gains or big pains, depending on how meticulously it is planned. See our Special Report on Image Processing Systems for important details.

## INSIDE LINES

## Looking for the 'classified' ads?

Sure, we like our name bandied about, but not like this: A *Washington Post* story last week described life in the Soviet Union for Edward Lee Howard, reputedly the first CIA agent to ever defect to Moscow. "Howard said he picks up *USA Today* and *Newsweek* on trips downtown, and the KGB bought him subscriptions to *National Geographic*, *Money* and *Computer World* (sic)," the *Post* said. Howard has been blamed for the reported execution of the Soviet who spied for the CIA.

## Wants to come in from the cold

Marcus Hess wants to tell his side of the case that was chronicled in Clifford Stoll's *The Cuckoo's Egg*. Hess is one of three German hackers who were nabbed for repeatedly rummaging through computers on the Internet network, gathering information for the KGB in exchange for cash and cocaine. Hess has penned a book in Germany, entitled *Hacker from Moscow*.

## Global information

Breaking into computers for fun and profit has taken on international flavor, posing new challenges in combating illegal hacking, according to many law enforcement officials. About half of the cases now under investigation by the U.S. Department of Justice in Chicago involve hackers who are illegally penetrating computer systems in the U.S. from overseas, according to William Cook, assistant U.S. attorney. New York state police officials said recently that every computer crime case it expects to handle from here on out will be a joint effort with the U.S. Secret Service.

## Domestic intelligence

A source recently shared with us a letter from Microsoft that, intentionally or not, redefines the term nondisclosure. The DOS 5.0 beta-testing program is so large that leaks are expected (go ahead, you'll feel better). So Microsoft has issued new nondisclosure guidelines: "Anything that we have confirmed publicly is not under nondisclosure. Finally, you are free to share information gathered from parties other than Microsoft, such as beta testers, other industry analysts or other publications." We look forward to hearing from you on this product. The letter, by the way, says, "February is likely, but it is *not guaranteed*" for the announcement of DOS 5.0, with its features of memory management, utilities, and a new shell.

## Steelmaker's launch

Sources close to the company say one thing you'll definitely see at Comdex/Fall '90 are notebook computers from Nippon Steel's newest subsidiary, San Jose, Calif.-based Librex Computer Systems. Librex plans to show six-pound units using Intel 80286 and 80386SX chips.

## Believe it when you see it

The ubiquitous IBM Personal System/2 Model 90 and 95 servers, which have popped up in slightly altered form in Japan and the UK, will finally make their domestic debut tomorrow in New York. IBM will have at least two of its OS/2 heavyweights on hand — Lee Resiweig and Dan Lautenbach — so it's likely they'll be unwrapping OS/2 Version 1.3, the 2M-byte version of OS/2.

## First the T-word, now the L-word

In a month when President Bush endorsed new taxes, DEC finally raised the possibility of layoffs. Ranking executive Jack Smith said last week that involuntary cuts are an option the company may consider if its voluntary severance plan does not trim away 5,000 employees by the end of June 1991. DEC began its second round of severance offers in September, offering a variety of financial options to people willing to quit. At last count, there were 124,000 employees worldwide.

The "Hi-Cap Group" — that's what it's dubbed by sponsors *Peripheral Strategies and Peripheral Outputs*, two market research groups — will hold its first meeting at Comdex/Fall '90 as it sets out in pursuit of an industry standard for the 20M-byte class of floppy drives and media. Make us your standard for information exchange; contact News Editor Pete Bartolik at (800) 343-6474, send a fax to (508) 875-8931 or message COMPUTERWORLD on MCI Mail.

"OUR PCs  
TURNED OUT TO  
BE THE PERFECT  
SOLUTION FOR X  
WINDOWS."

**My** management wants to leverage our investment in PCs. Can we use them as X windows terminals?

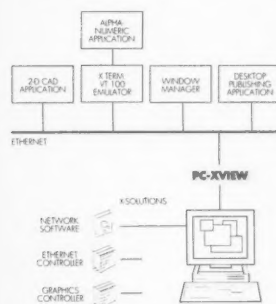
There's an answer. . .

**Spectrographics and PC-Xview.**

With PC-Xview and a simple Ethernet connection to a host supporting X windows, my PCs become fully functioning X stations.

I'll have the best of both worlds—X windows graphics plus all my DOS applications, functions and utilities. My PC users can also share data and applications with other X window system users.

When it comes to X window solutions, I know I can count on Spectrographics. They have all the right connections to put X window applications throughout my organization, from PCs to mainframes.



#### FREE X WINDOWS GUIDE.

For more information on PC-Xview, or a free copy of the X windows Guide, call (619) 587-6969, FAX (619) 450-0218. Or write, XGuide, Spectrographics Corporation, 9707 Waples Street, San Diego, CA 92121.

**SPECTRAGRAPHS**

CONNECTING WITH  
YOUR IDEAS.

PC/XVIEW IS A TRADEMARK OF SPECTRAGRAPHS CORPORATION. ALL OTHER TRADEMARKS AND COPYRIGHTS ACKNOWLEDGED. © 1990 SPECTRAGRAPHS CORPORATION





# QUALITY STARTS WHEN THE BUCK STOPS.

Quality doesn't come from some department, or an inspector, or a memo from the CEO.

Or from an ad, for that matter.

It comes from 20,000 people being given the freedom and the responsibility to do the job right.

It's happening at the new Wang. A revolution of power to the people.

Some examples:

Every single systems order we receive, no matter how big or small, is assigned to a group of people at the factory.

They "own" that order, from beginning to end.

They guide it through every

step of the order-build-ship-bill cycle. They personally ensure that a quality product is delivered, complete and on-time. First time, every time.

On a larger scale, every new product we develop for our customers is guided by a single program manager leading a program team.

Together, they "own" that product.

They have sole responsibility to determine the product specs, project costs and volume, set product introduction dates, establish training and customer service strategies—and most

importantly, only that team says when that product is fully debugged and ready to roll out the door.

And that team never turns its back on that product—or on you. Once the product is in your office, that team is fully responsible for customer service and future product enhancements as well.

At every step, the customer knows who to call with questions or ideas.

The owner. One call, one straight answer.

It's where the buck stops. And the quality starts.

LET'S GET TO WORK.

**WANG**



